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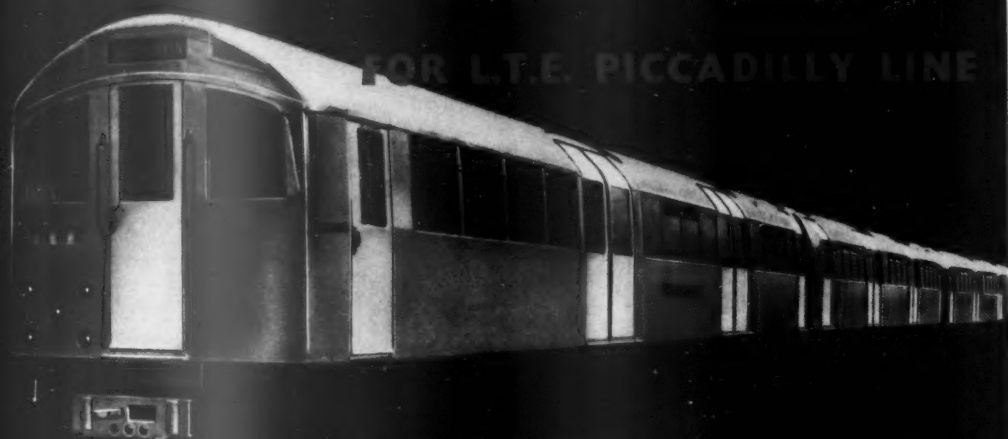
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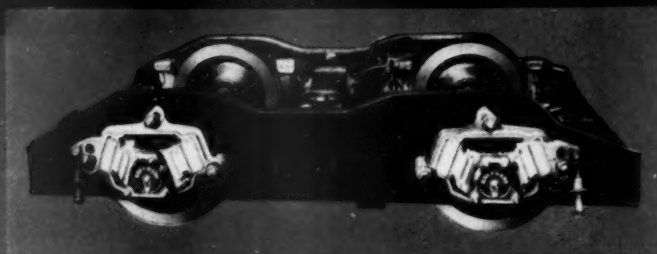
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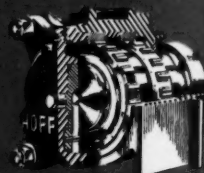
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The Seventeenth International Railway Congress

THE questions to be considered at the seventeenth session of the International Railway Congress Association in Madrid, from September 28 to October 7, show the changes in the relative importance attached to various problems since the sixteenth session was held in London in May, 1954. This year, 10 questions are on the agenda, instead of 11, though they will be divided, as before, between the five sections. They cover several matters of the utmost current interest to railways in almost every country, such as long-welded rails, design of railcars and multiple-unit diesel trains, periodical maintenance of electric locomotives, handling of "smalls" in depots, containers, palletisation, arranging a passenger timetable on conversion to diesel and electric haulage, and electronics in administrative, accounting, and statistical work. Delegates are expected to include Members and officers of the British Transport Commission and senior officers of British Railways. The many railway administrations contributing answers to the 11 questions include that of the U.S.S.R. Among reporters co-ordinating the replies from

what may be called, roughly, the group of railways in English-speaking countries or following British practice, are two officers of British Railways, Eastern Region. Mr. K. J. Cook, Chief Mechanical & Electrical Engineer of the Region, is to collate the answers on the repair and maintenance of electric locomotives; no doubt the experience gained with the Manchester-Sheffield electrification will be a useful background. Mr. G. F. Fiennes, Line Traffic Manager, Great Northern, will deal with replies on the passenger timetable problem. There are to be three other reporters from the British Commonwealth: Mr. N. C. Vogan, Chief Civil Engineer, New South Wales Government Railways; Mr. F. Jackson, Assistant Chief Civil Engineer, South African Railways; and Mr. S. L. Kumar, Director, Research, Indian Railway Board. It is hoped to publish summaries in forthcoming issues of this journal of the reports on the replies. The International Railway Congress Association is the only world-wide body concerned specifically with railways. Its proceedings, therefore, embody an unrivalled variety of thought and experience as to railways functioning in widely differing environments. The Spanish National Railways will be the host administration, Señor J. M. García Lomas, Vice-President of the R.E.N.F.E., is Chairman of the Executive Committee of the Congress. During their stay in Spain, delegates will have an opportunity of seeing much of interest in the fields of electrification and of new construction in difficult terrain. The answers received this year from railway managements all over the world, and the subsequent discussions on them, will provide a wealth of information and considered opinion of great importance to all concerned with the management and operation of railways and with supplying their material requirements.

Railway Extension in Uganda

ACTIVITY in new line construction in the Tseo, Lango, and Acholi Districts of Northern Uganda will serve to develop communications in the Northern Province of the Protectorate. As described elsewhere in this issue, a survey party is investigating the possibility of an extension of the railway from Soroti to Gulu; this, it is hoped, will enable a more exact estimate to be made of the cost of construction, than was available to the committee appointed by the Uganda Government in 1955 to report on communications in the Northern Province. The report included a recommendation that no northern extension of the railway from Soroti should be undertaken within the duration of the present Five-Year Development Plan, 1956-60; but it seems that agricultural development in the area and a possible further extension to provide a Southern outlet from the Sudan has called for a review of the position. It will be interesting to see whether Mr. J. R. Farquharson, who succeeded Sir Arthur Kirby as General Manager, East African Railways & Harbours last year, will initiate further surveys. As General Manager of the Sudan Railways he took a keen interest in new construction, including the project for linking the Sudan with West Africa, discussed in our issue of October 11, 1957.

Routing of Traffic with Central Africa

THE Benguela Railway, which is almost entirely British-equipped, for some time has shown commendable enterprise in promoting traffic between the Katanga region of the Belgian Congo and Rhodesia on the one hand, and through the Portuguese territory of Angola, the well-found port of Lobito on the other. This has taken the form of good service and of attractive rates quoted in conjunction with the Bas Congo-Katanga Railway and Rhodesia Railways. The result is reported to be a continued increase in traffic consigned via Lobito. Another traffic development in Central Africa, however, is unfavourable to British Commonwealth or British-equipped railways. A drop is reported in traffic between the Eastern part of the Belgian Congo and Dar es Salaam via Albertville, steamer across Lake Tanganyika, Kigoma, and the Tan-

ganyika Central line of East African Railways & Harbours; some of the traffic which formerly passed this way is now stated to be routed via the Congo port of Matadi.

Result of Congo Gauge Conversion

THE reason for routing this traffic via the Atlantic port appears twofold. Conversion from metre to 3-ft. 6-in. gauge of the Upper Congo-Great Lakes Railway, described in our issue of August 24, 1956, and the building of the Kamina-Kabalo link have afforded through running between the Eastern regions of the Congo and, over the Bas-Congo Katanga Railway, Port Francqui; from the latter place there is the river service to Léopoldville, whence the railway must be used, to avoid the rapids on the River Congo, to Matadi. Because of the transshipments, this route is no more convenient for traffic between the Eastern part of the Belgian Congo and countries overseas than that via Albertville, Kigoma, and Dar es Salaam. The impossibility of using the Suez canal during and after the Suez crisis probably has been a major cause of routing via Matadi, with, perhaps, official encouragement to consign through a Congo port.

Design Appearance in Railway Equipment

THE question of obtaining good design appearance (often termed "styling") in British Railways equipment, and the functions of the British Transport Commission Design Panel are discussed in a recent paper by Mr. G. Williams, Design Officer to the Commission. The paper, entitled "Design and Transport," was given to the Design & Industries Association. The British express locomotive is a great challenge to the designer concerned with the appearance of the modern diesel; to express the same power and speed exemplified by boiler, cylinders, motion, and so on, in what is externally an enveloping shell of rectangular proportion is difficult. The shaping of the leading end and the design and grouping of such items as cab and side windows of a diesel or electric locomotive appear to be the only major spaces which give the designer any scope, because of fixed dimensions. As Mr. Williams points out, a great deal can be done with colour and lining; but he dismisses the "drooping line" which has appeared on some diesel railcars in this country, as a "mild but dismal hangover" of a previous fashion. The desire to avoid altering, to any great extent, existing jigs, prevents the Panel from making any major stylistic alterations to passenger coach exteriors of existing designs, although changes of décor are being planned. The appearance of two entirely new train formations—an electric suburban and a luxury diesel express Pullman—however, has given the opportunity for redesign throughout.

Public Confidence and Staff Pride

THE advantage of good design of any component of railway equipment, from a commercial point of view, is also stressed by Mr. Williams; he believes that is now more generally appreciated. In public transport, nothing is too small to matter in making for a high level of appearance and amenity; the example of the former London Underground under Mr. Frank Pick, is cited as "a system where almost every detail of planning and design bears the evidence of the closest study of the fullest co-operation between designers in every sphere and the departments which they serve, and of control by an enlightened organisation." He also points out that the personality of an organisation can be suggested by the printing of a ticket just as clearly as the layout of a station or the furnishing of a restaurant car. Mr. Williams' basis of good design is "honesty and sincerity, coupled with technical ability and good workmanship." The Commission believes that good modern design must play a vital part in the modernisation of the service if the aims of the plan are to be achieved. That is, if the efficiency of the new and modern equipment can be clearly reflected in form and appearance, important results will be an increased sense of pride amongst the staff, and a new

confidence in the future of the service on the part of the public. If public goodwill towards the railways can be increased in this way it is to be given every encouragement; is it not possible, however, that what is aesthetically acceptable to one person (and therefore, one assumes, to a proportion of the public), may have an adverse effect on another? Tastes differ.

Monorail Link with London Airport?

THE visit to Cologne last week by Mr. G. R. H. Nugent, Parliamentary Secretary to the Ministry of Transport, to inspect the Alweg monorail system which is being operated experimentally in that city, has renewed public interest in this form of transport as a link between London Airport and London. The Ministry of Transport was authorised some time ago to consider ways and means of improving transport facilities between central London and London Airport; and there is support in some quarters for a monorail system largely because of the relative cheapness of construction. The Alweg monorail is a concrete track supported by concrete pillars. The trains straddle the track, and are equipped with vertical and horizontally mounted wheels with rubber tyres. Mr. Nugent was accompanied by Sir Alfred Bossom, who is chairman of a group concerned with encouraging the use of monorail systems. As described elsewhere in this issue, the group is promoting a system basically similar to the Alweg monorail, except that the cars would be fitted with road wheels so that they could leave the rail and travel along the road. Considerable advantage would be derived from such a system as the erection of fixed structures within the airport has been the drawback with previous monorail proposals.

Works Expansion on the Western Railway, India

CONSIDERABLE progress during the First Five-Year Plan has been made with the modernisation of the Indian Railways at an expenditure of some Rs. 432 crores, which included Rs. 240 crores spent on rolling stock. Among the objectives are development of basic and heavy industries and provision of some 850 miles of new lines. All this will throw an increasing load on the railways. Regrouping of the railways and absorption of smaller undertakings in 1951 increased the mileage of the six (now seven) major railways in the Republic, and their ownership of locomotives, carriages, and wagons; this considerably affected the repair capacity available. Perhaps the least fortunate in repair capacity to deal with the additional rolling stock is the Western Railway, particularly on the metre-gauge section, because the additional mileage was the result of absorbing a number of small metre-gauge systems formerly owned and managed by the princely States. For various reasons these were less well equipped than the Class I railways. Elsewhere in this issue is the first of two articles which deal with the expansion of the Western Railway Ajmer locomotive, carriage, and wagon works, with the object of increasing the repair capacity for metre-gauge stock. The programme also includes the erection of new metre-gauge shops at Rajkot, and the provision of additional repair capacity for the broad-gauge system of the Western Railway.

Riding Qualities of Passenger Vehicles

THE assessment of the riding qualities of rolling stock, from the point of view of passenger comfort, need no longer be the arbitrary matter of relying on memory or feelings as often has been in the past. Some engineers for example have watched the steadiness of a cup of tea, or timed how long an ordinary hexagon pencil, a few inches long, would stand on end when placed on a flat surface. Features which resulted in improved riding were retained and developed often with only a hazy understanding of the principles involved. Some designers have favoured a heavy coach body to assist smooth riding; but it is obviously of advantage, by reducing first and operating costs, for vehicles to be as light as possible. With the development of scientific method, it is only natural that

accurate ways of measuring the behaviour of vehicles should have been developed. The subject is one of considerable topical interest. A great many people, therefore, have been waiting to hear the views of Mr. J. C. Loach, Superintendent, Vehicle & Track Division, Research Department, British Transport Commission, Derby, whose paper describing a new method of assessing riding qualities was due to be presented to the Institution of Locomotive Engineers yesterday (Thursday), too late for editorial comment in this week's issue.

"Chatham & Dover" Centenary

FOR various reasons—geographical, geological, political, and economic—the main line of the South Eastern Railway adopted a circuitous route to Dover 88 miles long, and used 20 miles of the London and Brighton main line to Redhill before turning eastward. This left the traditional route through North Kent unserved by rail. When the East Kent Railway was promoted to build a line from Strood to Canterbury, it was regarded as complementary to the S.E.R., and an extension of the existing railway from London to Strood. By the time the first section was opened, 100 years ago, the situation had changed. The East Kent was changing into a main line, which was to prove a fierce competitor of the S.E.R. for four decades. The East Kent Railway Company was incorporated in 1853. Its first section, from Chatham to Faversham, was opened on November 11, 1857, but public traffic did not begin until January 25, 1858. Completion of its bridge across the Medway enabled the link from Chatham to Strood to be opened on March 29, the same day on which the first West End terminus (the "Pimlico" Station in Battersea) was brought into use.

Entry of L.C.D.R. into London

THE West End of London & Crystal Palace Railway was already building its so-called Farnborough extension from Norwood to Shortlands, opened on May 3, 1858. Another company, the Mid-Kent (Bromley to St. Mary Cray) Railway, opened the section from Shortlands to Bickley on July 5 of that year. The East Kent had a Bill before Parliament for its Western Extension (Rochester to Bickley), and this received the Royal Assent on July 23, at the same time as the Act of incorporation of the Victoria Station & Pimlico Railway. The outcome was that both lines were completed by 1860, and the East Kent Railway, which had changed its name on August 1, 1859, to the London, Chatham & Dover Railway, emerged as a highly competitive main line. Under the leadership of James Staats Forbes, it took a prominent part in his long feud with Sir Edward Watkin, Chairman of the South Eastern Railway Company. Although in 1899 the rival concerns composed their differences under the South Eastern & Chatham Railway Companies Managing Committee, the L.C.D.R. retained its corporate existence until grouping in 1923.

A.A.R. Research Activities in 1957

LAST October, as Chairman of the Association of American Railroads, Mr. William T. Faricy, received at Philadelphia, on behalf of the Association, the Henderson Medal awarded by the Franklin Institute "in recognition of the many achievements of the Mechanical and Engineering Divisions in the field of railway engineering." The sixth annual report of the A.A.R. research activities at its Research Centre, located in the precincts of the Illinois Institute of Technology in Chicago, tells of the progress made and of the work, embracing many spheres of railway activity, which has been, or is in course of being, accomplished there.

A development in 1957 was the completion in July of the engineering laboratory and the installation of the necessary testing equipment. This building, in due course, will house the facilities for the fatigue tests of car axles, tests of diesel fuels and lubricants, rolling load tests of rail metallurgy and welding, and fatigue tests of rail joints

and butt welds. Laboratory tests of ballast and soils, tie pads, and tie plate fastenings and fatigue tests of structural beams and girders are also to be undertaken.

Those who have visited this A.A.R. research centre at Chicago, including, it is understood, the Chairman of the British Transport Commission, Sir Brian Robertson, and the members of the delegation which accompanied him on his tour to the U.S.A. and Canada last autumn, will have been impressed with the research work being carried out there in the testing of loading methods and containers—the word container being used in its American sense of a method of packing, such as a carton, or box. The Container Laboratory conducts courses as a free service for traders' representatives and Government employees, including the armed forces; 11 such courses have already been completed, with over 220 persons registering, representative of 150 companies from all parts of the U.S.A. and Canada. This is one of the means by which loss and damage in freight movements, with the resultant claims, is being tackled. One problem has been the handling and packing of motorcar windshields which change in contour in accordance with fashion; here the solution has been found to lie in the design of a suitable pallet unit. The packing of citrus juice in waxed containers and the materials best employed for the protection of furniture in rail movement represent other activities of this section.

The research conducted by the Engineering Division is primarily concerned with the activities of the various committees of the A.A.R. Copies of the full programme were made available in 1956 to members of the American Railway Engineering Association in a booklet entitled "Catalogue of Research Projects." They cover a very wide field, with which there is not space to deal here, but mention is specifically made in the A.A.R. Research Centre report, under the general heading of "Roadway," of the development of nuclear light sources for the illumination of warning signs, of tests with soil pressure cells on a new marshalling yard site, and soil test data in connection with a deviation scheme in North Carolina, intended to determine the moisture content and the plasticity content of residual soils.

Roadbed stabilisation has been the subject of many investigations and, to cope with such questions, a soil laboratory has been provided at the Centre, whilst ballast materials have been tested with oscillators, samples being subjected to loading equivalent to 60 million tons of traffic. Pumping track has been the object of laboratory and field tests and the chemical control of vegetation provided another activity of considerable importance, especially to the railways serving the Southern States. Many other permanent way problems figure in the report, concerning matters such as sleepers, fastenings, solid manganese crossings, or corrosion from the brine drippings off refrigerator cars, while studies of the dynamic wheel loads of steam locomotives were requested by the Norfolk & Western Railway.

Level crossing protection and the programme covered by the detector car used to locate rail failures provided other aspects of the research activities, with the investigation of welding techniques, particularly in connection with battered rail joints. Fire resistant coatings for timber structures have not been omitted from the list of activities carried out nor has the assembly of data concerning protection and painting of steel structures. In the Mechanical Division, research included matters as varied as lubrication, journal bearings and the fatigue of axles, and sanitation.

This short summary can indicate only a few of the tasks performed by the A.A.R. at its Chicago centre. The successes obtained should be linked with the name of Mr. G. M. Magee who, since its inception, has been in charge of the work, and on whose shoulders lay the burden of its organisation and equipment. With the years the annual reports have grown in interest and the excellence of their production, whilst the award of the Henderson medal is a fitting tribute to the A.A.R. and, indeed, to Mr. Magee.

The Association membership embraces railways with a

route mileage of about 220,000; so that the great effort made is proportionate to the scope of the problems to be solved. British Railways in their smaller sphere have excellently equipped research laboratories at Derby and the International Union of Railways has its Office for Research & Tests (O.R.E.) at Utrecht; but neither of these, so far as is known, has produced a well-illustrated booklet, designed for wide circulation, showing its facilities and telling in non-technical language of the problems it is engaged in solving.

Freight Transits

THE importance of giving reliable freight service to the railways' customers has been much stressed in the past few days. It was a principal theme of the paper given to the Institute of Transport last week by Mr. C. P. Hopkins, General Manager of the Southern Region of British Railways; this provoked an animated discussion, and was the subject of some comment in the national Press. The same emphasis is given again by Mr. G. F. Fiennes, Traffic Manager of the Great Northern Line of the Eastern Region, in his most informative paper illustrated with slides which he gave last Tuesday to the Industrial Transport Association. This went far to show the audience something of what has already been done and is being done to improve the service given to railway users—and to ensure that it remains satisfactory.

The title is "The Future of Railway Development as it Affects Transit," and it is largely on transit, and its importance, that he dwells. Nevertheless, although he insists on good and reliable service, he tends, perhaps through a sense of fairness and too meticulous a desire to omit nothing bearing on the problem, to weaken his own case. All railwaymen should know the lamentable position as to railway freight receipts. Mr. Fiennes, however, states that "all of us are in the doldrums: deep-sea shipping . . . road hauliers engaged in a cut-throat rates war, railways losing traffic fast, 'C'-licence holders hoping not to be noticed in case some one finds a means of controlling them by legislation." There are, unfortunately, some railwaymen who will take comfort from these words, though without reason.

He rightly makes a disclaimer about the modernisation plan, and points out the danger of railway servants relying too much on it. He spoils the effect by adding that by publicising the plan the railways imply that they are not modern now and that their customers may infer that their services are out of date. The term "modernisation plan" implies that the railways are—as many of their customers know very well—out of date in their lack of certain physical equipment; that, in the vast majority of cases, is not the fault of railway managements, past or present. The existence of a modernisation plan does not, however, imply that all railwaymen cannot be as up-to-date and alert in mind and spirit as managers and men in more favoured industries. Nor, as Mr. Hopkins was at pains to point out, and Mr. Fiennes also states, need the absence of physical equipment due to be provided under the plan, but not yet forthcoming, preclude steps to achieve reliability of service whilst making do with the equipment already available.

A lucid account of freight traffic handling is given in the paper, with special reference to certain aspects of freight train working—including running speeds—and the location and operation of marshalling yards; in both these subjects Mr. Fiennes, as a former operating officer, has contributed much to the efficiency of the Eastern Region. He goes on to mention containers and pallets and other aids to improving services. His remarks on the relatively low cost of higher train speeds, and the figures he gives showing the high proportion of traffic handled at private sidings, will surprise many.

All this is of the utmost interest, and indeed Mr. Fiennes' paper in this respect is one of the best we have ever heard. Nevertheless, fewer consignments are being entrusted to the railways—despite the fact that last December, not a very good month for

transits, the Eastern Region loaded 196,410 wagons and that its District offices and headquarters received less than 100 complaints about transits. There must be some cause of the loss of that marginal traffic which should go so far to put British Railways' finances in balance. Is the standard of punctuality high enough? He observes as to freight train punctuality: "We take 30 min. as a standard because no freight train has connections so tight that half-an-hour late will miss them. . . . With punctuality in the 70 or 80 per cent, we are doing pretty well. So much for the reliability of the trains." No doubt he is right, but somewhere there is a lack of precision, resulting in delays and losses. Despite the undoubted achievements of British Railways in handling freight, they have somehow earned a bad reputation with a part, perhaps even a small one, of potential consignors by rail. In view of the evidence of satisfactory transits referred to above, it is probable that all who despatch and receive by railway on a considerable scale—as for instance many members of the Industrial Transport Association—would admit that the service given is, on the whole, good—but many people will have to be persuaded of this.

Bombay Transport Problems

IN a recent address delivered in Bombay, Mr. M. Ganapati, General Manager of the Western Railway of India, discussed the transport problems of that city with special reference to his own railway. First, however, he expressed the view that the only feasible long-term solution of the internal traffic problem—for which the Municipal Corporation was primarily responsible—was the construction of an underground railway. The soil under the city lent itself to comparatively economical cut-and-cover construction, and its first two stages from Bombay Central to Museum via Victoria Terminus and Churchgate, and back via Ballard Pier, Victoria and Girgaum, had been estimated by Japanese consultants to cost some Rs. 28 crores (£21,000,000). Such expenditure, he added, could not at present be considered but would eventually have to be faced. This project was referred to editorially in our issue of November 22, 1957.

Turning to his main theme, Mr. Ganapati said that at present between 900,000 and 1,000,000 suburban passengers poured into the city daily from stations on the Central and Western Railways, mostly to businesses in the Victoria-Churchgate area. In 1938-39 the Western Railway carried 48,000,000 suburban passengers with 20 eight-coach multiple-unit electric train sets at its disposal. By 1951-52 the number of local passengers had risen to 145,000,000, and although six more sets were acquired, the 26—22 in daily service—had to accommodate 178,000,000 until October, 1956. By June, 1957, five more rakes were available and it was possible to run 347 trains daily. The four-fold increase in passengers had, therefore, still to be met with a 56 per cent increase in stock.

Mr. Ganapati regretted the inability of India to manufacture her own multiple-unit stock and the shortage of foreign exchange available, but he hoped that it would be possible to acquire the further 105 units of electric stock included in the Second Five-Year Plan programme, and so ease the overcrowding problem. Meanwhile, existing stock is being rehabilitated, and various measures are being taken to speed up traffic. There are 14 trains an hour, but it is hoped to increase the number to 17 or 18 when the additional stock is available and the works mentioned below have been carried out.

These improvements include the rebuilding of Churchgate Station, the provision of island platforms at various stations to serve fast trains, and of additional block stations, loops, stabling lines and crossovers, and other facilities. Perhaps the most important proposals are to extend platforms and run nine-coach trains, and provide a third line between Grant Road and Churchgate, the existing double-line bottleneck in the otherwise four-track suburban area. As this triplication would be in the city area its consummation would depend on land acquisition.

New Zealand Government Railways

WE have received from Mr. A. T. Gandell, General Manager of the New Zealand Government Railways, the Railways Statement for 1957, by Mr. J. K. McAlpine, Minister of Railways, and the General Manager's report for the year ended March 31, 1957. The Minister's statement shows that there was a net operating loss during the financial year of £269,373 on the working of the whole department, including road and air services; the figure for railways alone was £187,309. This loss was caused by an increase in gross expenditure of £2,205,310 resulting mainly from higher wages, depreciation, and renewal charges, and by the employment of additional staff. On the other hand, the increased rates and fares current from November 19, 1956, realised an additional £800,000, but goods tonnage fell during the year. All things considered, however, the net result was considered rather better than expected.

An outstanding event during the year under review was the passing of the Government Railways Amendment Act, 1956, providing for reversion from control by a Commission to control by the Minister and the General Manager; the Act took effect from April 1, 1957, when the Directors, Messrs. W. E. Hodges and C. H. Bray retired on superannuation after 40 years' railway service, Mr. Gandell remaining as General Manager.

His report records that purely railway operation during 1956-57 produced a revenue of £28,507,109 against an expenditure totalling £28,694,418. Though there was thus an overall loss of £187,309, North Island lines secured a net profit of £989,008.

Some of the principal railway results were:—

	1955-56	1956-57
	Millions	Millions
Passenger journeys	25.08	25.38
Goods tonnage	10.04	9.70
Total train-miles (revenue)	14.88	15.10
	£ millions	£ millions
Coaching traffic earnings	3.29	3.43
Goods	24.07	24.43
Total operating revenue	27.87	28.51
Net operating results	1.10	-0.19

During the year 30 English Electric 750-h.p. diesel-electric and 4 "Ja" class steam locomotives were placed in service; 76 steam locomotives were withdrawn from stock. Altogether there were 97 diesel-electric locomotives in traffic and 31 on order on March 31, 1957, 10 of the latter being of 1,425 h.p. and 6 shunters.

To enable effective use to be made of the General Motors and Clyde 1,425- and English Electric 1,500-h.p. diesels on the North Island trunk line, freight services on that line were reorganised in May, 1956; a similar policy was adopted for secondary lines. In fact, these diesels hauled 42 per cent of the total gross trunk-line tonnage—double the previous year's figure—during the year as a whole, but during its last month it rose to 49.3 per cent. Their efficiency on heavy gradients was particularly marked. For instance, in ascending the seven-mile spiral from Raurimu to National Park, 640-ton goods trains now take only 20 min. as against 35-40 min. taken by 580-ton steam trains. Moreover in the South Island 18 diesel-worked trains between Dunedin and Oamaru do the same daily work as 28 steam trains and take 2 hr. less journey-time.

Taking into account all major and minor items of expenditure, including depreciation and interest charges, it was estimated that diesel working saved the department £380,000 during the year. Additionally, it secured important indirect savings, such as great relief in line and yard congestion, better use of wagons, and many other operating advantages.

The total locomotive and railcar mileage run during 1956-57 was nearly 22,000,000, rather more than half being by steam locomotives. Of the 35 twin articulated railcars ordered from the U.K. in 1950, 14 were added to stock during the year bringing the number in service up to 33. Railcars accounted for 67 per cent of other-than-suburban train-mileage in the North Island and 72 per cent in the South Island. Current wagon-building programmes included the building of 4,263 additional wagons,

of which 2,300 were of 15-ton capacity on order in the U.K. and under delivery.

The route-mileage fell during the year from 3,422 to 3,417 due mainly to the closing of the Mount Somers-Springburn section. Work on the Auckland-Frankton doubling continued satisfactorily and by the end of the year 68 miles were completed and in use. Construction of the new bridge to replace the one over the Whangau River at Tāngiawai destroyed by a flood at Christmas, 1953, was well advanced and was expected to be completed during 1957. A flood warning device has been installed above the bridge to notify the approach of any abnormal spate in future. During the year under review 23 automatic warning devices were installed at level crossings, bringing the number of protected crossings up to 250; 35 more were to be fitted with automatic alarms during 1957-58. To minimise danger to road- and rail-traffic alike at crossings, it was found that the lighting of headlamps on diesel locomotives and railcars in daylight assisted in accident prevention.

Of the subsidiary services run by the department rail-air freights rose to 27,480 tons, 1,150 tons more than in 1955-56. The road services had 753 passenger and 314 goods vehicles in use, and 19,000,000 passengers were carried.

British Transport Commission Traffic Receipts

THE incidence of Christmas last year is stated to have resulted in people travelling longer distances for their few days' holiday, though there seems to be no reason for this, as, in 1956, most people had the weekend free preceding the festival. At any rate, any increased long-distance travel is not apparent in British Railways passenger receipts for Period 13 of 1957, the four weeks ended December 29 last. These show a slight decrease compared with the corresponding four-week period of 1956, despite the fare increases in the meantime.

	Four weeks to December 29, 1957		Incr. or decr.	Aggregate for 52 weeks		Incr. or decr.
	1957	1956		1957	1956	
	£000	£000	£000	£000	£000	£000
Passengers—						
British Railways	9,578	10,225	- 647	138,546	126,915	+ 11,631
London Transport:						
Railways	1,755	1,789	- 34	22,998	22,129	+ 869
Road services	4,308	4,301	+ 7	59,190	55,590	+ 3,600
Provincial & Scottish buses	4,147	4,073	+ 74	57,540	56,630	+ 910
Ships	306	286	+ 20	6,895	6,333	+ 562
Total Passengers	20,094	20,674	- 580	285,169	267,597	+ 17,572
Freight, Parcels & Mails—						
British Railways:						
Merchandise & live- stock	7,098	8,160	- 1,062	106,925	104,977	+ 1,948
Minerals	3,873	3,926	- 53	53,320	51,992	+ 1,328
Coal & coke	9,964	9,565	+ 399	127,664	126,039	+ 1,625
Parcels, etc., by passenger train	3,959	3,696	+ 263	51,352	47,422	+ 3,930
Collection & deli- very, etc.	966	990	- 24	13,359	12,853	+ 506
Total Freight British Railways	25,860	26,337	- 477	352,620	343,283	+ 9,337
Others*	3,875	3,981	- 106	55,224	55,687	- 463
Total Freight, Parcels & Mails	29,735	30,318	- 583	407,844	398,970	+ 8,874
Total	49,829	50,992	- 1,163	693,013	666,567	+ 26,446

* Inland waterways freight, road haulage, and ships

The drop in traffic reported by London Transport is not seen in the results for Period 13, in which the differences compared with the previous year are marginal. The gratifying increase in ships' passenger receipts already recorded for previous four-week periods of last year continued: at £306,000, receipts for Period 13 are £20,000 up on the 1956 figure. It would be interesting to know how much of this was contributed by pre-Christmas departures for winter sports holidays on the Continent.

British Railways merchandise and livestock receipts for

the period at £7,098,000 are as much as £1,062,000 below those for Period 13 of 1956. The incidence of Christmas may perhaps be said to vitiate comparison of the two years. The aggregate for 52 weeks of 1957 and 1956 may give a truer comparison: at £106,925,000 merchandise and livestock takings exceed the 1956 aggregate by £1,948,000. This figure will have to be bettered if the railways are to pay their way. Mineral traffic for Period 13 was slightly less than for the same four weeks of 1956. Coal class traffic at £9,964,000 showed an increase of £399,000 over the 1956 figure; coal loadings were reported to be heavy immediately before the Christmas holiday.

The aggregate traffic receipts of the Commission for the 52 weeks of the past year at £693,013,000 exceeded those for the same period of 1956 by £26,446,000. This is not an encouraging result, especially when one bears in mind rises in prices of materials and equipment being supplied to the railways, and the possibility of a wage increase for railwaymen in the near future.

PERCENTAGE VARIATION 1957 COMPARED WITH 1956

	Four weeks to December 29	52 weeks to December 29
British Railways—		
Passengers	+ 6.3	+ 9.1
Parcels	+ 7.1	+ 8.2
Merchandise & livestock	-13.0	+ 1.8
Minerals	- 1.3	+ 2.5
Coal & coke	+ 4.1	+ 1.3
C. & D. services	- 2.4	+ 3.9
Total	- 3.0	+ 4.4
Ships (passengers)	+ 7.0	+ 8.8
British Road Services, Inland Waterways & Ships (cargo)	- 2.6	- 0.8
Road Passenger Transport, Provincial & Scottish	+ 1.8	+ 1.6
London Transport—		
Railways	- 1.9	+ 3.8
Road services	+ 0.1	+ 6.4
Total	- 0.4	+ 5.7
Aggregate	- 2.2	+ 3.9

LETTERS TO THE EDITOR

(The Editor is not responsible for opinions of correspondents)

Passenger Coach Design

January 6

SIR,—I think Mr. Maurice Jay, whose letter is published in your December 13 issue, is making two rather common errors.

First, he compares standard British pool service rolling stock with de luxe Continental and American vehicles for which supplementary fares are charged. Although there is plenty of scope for further improvement, it cannot be disputed that the interior appointments of a standard British second class coach are superior to its Continental counterpart. Apart from the rather austere seating of the latter, the provision of such an elementary refinement as heated toilet water is practically unknown. Where the British vehicle does fall below Continental standards is in its riding qualities, taken over the whole period between overhauls.

Mr. Jay's second error lies in ignoring the fact that the allowable capital and running costs of a vehicle are entirely dependent on its revenue-earning capacity.

With regard to appearance, there are no absolute standards, and so-called good appearance is purely a matter of personal opinion. Taking the coaches shown at Battersea as an example, in my view the only definite advance over the present practice was the reclining seat. All the other vehicles were merely dressed up with gimmicks (e.g. vertical matchboarding and brass fittings in South Eastern & Chatham Railway style) which will be out of date before the vehicle is five years old. Some features were quite unsuitable, such as the shell-like washbasins by one eminent architect which lacked the elementary feature of an anti-splash lip.

From the operating point of view the number of seats per vehicle was seriously reduced as compared with standard vehicles, whilst their total weight was increased. At a time when road and aircraft operators are lowering their standards to get more seats per vehicle or aircraft, an increase in running costs per seat-mile cannot be borne by the railways except at supplementary fares. Furthermore in some Regions of British Railways the peak traffic density is such that traffic would have to be refused if present seating densities were reduced. I have not seen any costs quoted for vehicles built to the prototype designs but it would surprise me if they are not something like double the price of today's design. The passenger gets what he pays for and at present fare levels he is extremely well served by British Railways.

Architects should stick to their own business, i.e. the design of buildings. It is to be hoped that the British Transport Commission will soon realise that rolling stock designers in this country can produce fundamentally improved vehicles without these people looking over their

shoulders, and also provided they are given the same freedom to depart from so-called British Railways standards which is given to the stylists.

Yours faithfully,

W. J. WILLIAMS

10, Rathgar Avenue, W.13

Standardisation of Rolling Stock

January 20

SIR,—I should like to add some observations in the light of your comments on my letter published in your issue of January 17.

When one considers the wide experience of private British manufacturers in building diesel locomotives of all types for overseas railways, it is difficult to understand why such an extensive trial of so many different prototypes should have been necessary. In any case, whatever the marginal advantages that might have been gained from this course of action, the British Transport Commission is already forgoing them by placing large orders for 52 diesel-hydraulic and 45 diesel-electric locomotives before any operating experience has been gained with prototypes.

While it is certainly more economical to have 2,000-h.p. besides 1,000-h.p. locomotives, I see little justification for having 800, 1,250, 1,500, 1,750, 2,500, and 3,000-h.p. designs as well; and none whatsoever for different Regional designs of the same types. In trying to match the different operating requirements of each line to such a nicety, the Commission is ignoring its own intention to use many diesel locomotives as stop-gaps on some main lines before they are electrified. Many diesel locomotives will thus have to work on several different lines during the course of their 40 years' working lives. This is also the main argument for standardising diesel locomotive design on a national level.

In ordering more than two or three locomotive types and in allowing Regional autonomy of design, the practice of the Commission differs not only from North American, but also from the practice of every other European railway administration. Yet there is probably a greater diversity of operating conditions on the French, Italian, and German railway systems than there is on our own.

In any case, if inter-Regional standardisation is unnecessary, why did the now defunct Railway Executive make such an issue of standardising steam locomotives and passenger carriages in 1951, thereby incidentally standardising a main-line express passenger coach design, whose comfort, riding qualities and noise-proofing are all inferior to postwar L.M.S.R. and L.N.E.R. designs?

Yours faithfully,

F. E. LAMOND

29, Oakwood Road, Bricket Wood, St. Albans

THE SCRAP HEAP

Regional Flowers

The reference in the Scrap Heap of January 10 to the provision in the restaurant cars of the "Royal Duchy" express of the Western Region of British Railways, of flowers from the Scilly Isles, reminds a correspondent of a similar amenity on the former Great Eastern Railway. In the "Norfolk Coast Express," which ran before the first world war between Liverpool Street and Cromer, poppies, as being representative of East Anglia, were placed in metal vases on the restaurant car tables.

Mass Transportation

The ability of railroads to handle any and every type of commodity has earned for them the title of specialists in mass transportation. Yet, at times, too much is expected of the carriers. The case of the stationmaster at Pearl River, La., is a good example. According to the *Louisiana Conservationist* magazine, this stationmaster was stuck with 288 crated rabbits when the addressee refused to accept them. On successive days, the bunny population grew to 408—570—752—962 and 1,227. At the reproductive point, the stationmaster opened the crates and turned his back.—From "Texas & Pacific Topics."

A Kenya Character

Now and again, among railwaymen, there is thrown up a "character;" one such as this is Mr. "Bill" Buttery, whose recent retirement, after 32 years' service with East African Railways & Harbours and their predecessors, is recorded in our personal columns. A Tynesider, he joined the North Eastern Railway at an early age. From his earliest days he was associated with

control work necessitating almost constant use of the telephone. He has a loud speaking voice and is believed by his staff to have been the original of the story: "What is that noise?"; "It is Mr. Buttery speaking to Kisumu;" "Then why doesn't he use the telephone?" His colleagues on E.A.R.&H. testify that with the public in East Africa, and the farming public in particular, he enjoyed a reputation for absolute honesty. If he said a wagon would be available to load wheat on a certain date, it was there. To a great number of people both in Nairobi and in the country, the railway was Bill Buttery.

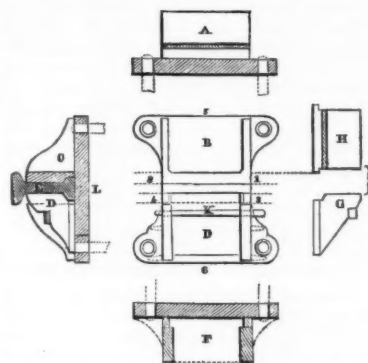
Railway Strait Jackets

The death of Huskisson, at the opening of the Liverpool & Manchester Railway in 1830, when George [Sir George Cayley] was present, prompted a deep concern in safety of railways. Designs for improved braking and signalling methods flowed from his facile pen. The "up" trains should be compelled to keep to one set of rails and the "down" trains another. Padded cushions—then only fitted in the first class—should be also fitted to lessen the shock in third class carriages—"each man's life being equally valuable to him." He suggested a broad webbing band to fasten each passenger in place, although he admitted "he did not much fancy John Bull in a strait jacket."—Charles Gibbs-Smith in "The Times."

"North of England" Railway Chair

A correspondent has sent us some details of the "North of England" railway chair, which came into use at York in 1840. The contemporary engraving (above, right) including the plan (B) and various sections makes the

principle clear. The chair was used on the line completed in April, 1841, as the Great North of England Railway (later part of the North Eastern). It was considered well adapted to the rail and simple in its principle. The middle chair, besides the cheek chairs, were on



Contemporary drawings (1840) of the "North of England" chair

the same construction, but varied in weight: joint chair, 40 lb.; middle chair, 41 lb., and cheek chair, 30 lb., with 60-lb. rails.

The diagram A is the section from 1 to 2; B, plan of chair; C, section from 5 to 6; D, locking cheek in place; E, rail; F, section from 3 to 4; G and H, side and end of locking cheek; K, malleable iron key or wedge; and I, stone blocks or wood sleepers. It is not known how far this chair was used or when it was abandoned in favour of a standard pattern.

Museum Pieces

[The problem of railway relics]

Much ink is being splashed of late
About the situation
Of relics of the former great,
Doomed to disintegration.
Yet, after all, new lamps for old
Is a familiar story;
Though veterans, cast out in the cold,
Regardless of past glory.
Must, one imagines, find it hard
To end their days among
The debris of a distant yard,
Unhonoured and unsung.

Alas, that locos once cavorting
Along some famous run,
Are now no longer self-supporting,
Duty and distance done!
Bless all their fireboxes; I trust
I may be spared to see 'em
Snatched from the ravenous maws of
rust
And snug in a museum.
Some risk embraces me and you,
For, when affection ceases
For age and beauty, we may, too,
Become museum pieces.

A. B.

Station Architecture in New South Wales



Photo]

[Guy Bakewell

Emu Plains Station, New South Wales Government Railways, a Victorian structure reminiscent of station architecture of that period in Britain

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

QUEENSLAND

Diesel-Worked Fast Freight Trains

The Queensland Railways administration has recently introduced fast freight services to give three-day deliveries at Cairns, 1,043 miles from Brisbane, and also at Longreach 823 miles on the central line. All Brisbane-Rockhampton freight trains are now diesel-worked, and two of the three fast freights to Townsville are also hauled by diesels, one scheduled at passenger speeds. Winton will also be included in similar fast services.

EAST AFRICA

Proposed Line from Soroti to Gulu

A survey party has begun work on the route through the Tseo, Lango, and Acholi Districts of Uganda for a possible extension of the railway from Soroti to Gulu.

About 1928, a survey was made for approximately 40 miles beyond Soroti and it is now proposed to extend this survey over the remaining 30 miles to Lira, and to undertake a reconnaissance survey as far as Gulu, about 60 miles from Lira. Such surveys will enable a more exact estimate to be made of the cost of construction of such a rail extension than was available to the committee which was appointed by the Uganda Government in 1955 to report on communications in the Northern Province. This committee submitted its report in April, 1956, and in May, 1956, it was laid on the table of Uganda Legislative Council.

The report included a recommendation, amongst others, that no northern extension of the railway from Soroti should be undertaken within the duration of the present Five-Year Development Plan, 1956-60, but that the position should be reviewed and a further

economic survey undertaken in connection with the preparation of the Uganda Protectorate second development plan for the period 1961-65. This recommendation was made in the light of the findings that tonnages likely to pass over the projected line by 1960-62 will be such as to justify its construction and operation.

The survey is being undertaken by the Chief Engineer of East African Railways & Harbours, Mr. C. T. Henfrey; the survey party is in the charge of Mr. P. L. A. Marsh, who has been previously involved in the North-South Rail Link and the Morogoro-Korogwe surveys in Tanganyika.

SOUTH AFRICA

Level Crossing Eliminated

Two further level crossings were eliminated when a 4½-mile deviation on the Rusthof-Standerton section of the main line between Johannesburg and Durban was opened to traffic recently. This section includes a new station at Platrand and forms part of the scheme of improving the 135-mile section on the Transvaal portion of the Durban-Johannesburg main line between Union and Volksrust at a cost of £8,950,000. When completed a further 13 level crossings will have been replaced by grade separation structures.

RHODESIA

Electronic Calculators Installed

The first Hollerith 550 electronic calculating machine to operate in the Federation has been installed in the Rhodesia Railways mechanised accounting office at Bulawayo under the control of the Chief Accounts & Finance

Officer. Divided into two parts, one unit feeds and reads punched cards, while the other unit, which is electronic with no moving parts, receives the information and produces the answers.

Apart from stores work it will be used to compute certain revenue statistics and the depreciation of fixed assets, whilst later the machine may be used for operating statistics. When the machine was installed five days' work in connection with the stores ledger remained for completion. By using the electronic calculator this work was finished in 2 hr.

CEYLON

Flood Damage

The Minister of Transport & Works estimates that it will cost about Rs.150,000,000 to repair damage caused by the recent floods to the road system and the railway, inclusive of Rs.50,000,000 for rolling stock destroyed. Parliament is to be asked to sanction creation of a special vote from which all expenditure towards repairing damage is to be made.

CANADA

Manufacture of Budd Equipment

The Canadian Car & Foundry Company has started a \$15,000,000 expansion programme with a view to manufacturing the Budd diesel railcar (the R.D.C.) and the Budd stainless-steel cars which are at present being used by the Canadian Pacific Railway on their "Canadian" trans-Canada trains.

The programme involves the construction of new building and shops, the modernisation of existing buildings, and the replacement of equipment, at the company's plant in Montreal.

The main production lines will be



The C.P.R. "Canadian" composed of Budd stainless-steel rolling stock, at Gap Lake Mountain, Loughheed



Budd diesel railcar crossing Nith River Bridge at Ayr, Ontario, Canadian Pacific Railway

devoted to the four models of the R.D.C. cars. They are all powered by two 300 h.p. diesel engines and can operate from either end, as single units or in any required multiple controlled from a single position. All models are equipped with Budd railway carriage disc brakes, and all except the No. 4 are air-conditioned.

UNITED STATES

Long Island Bridging Feat

On the North Shore line of the Long Island Railroad, near Manhasset, a new four-lane highway had to be carried under the railway at a point where the latter ran on a high embankment, 200 ft. long, which was to be replaced by a three-span plate-girder viaduct. It was not possible to run the track round a temporary deviation line at this point. It was necessary, therefore, to build the viaduct under the existing track without any serious interruption to the train service.

The new abutments were built under the track, and the three spans, one 89 ft. 4 in. long, the two others 68 ft. 1 in. and all 7 ft. deep, were run to the site and unloaded on to rollers adjacent to the track. On each span the track, including the electric third rail, had been laid and completely ballasted in advance.

For moving the spans into position, complete possession of the line was obtained at 11 p.m. on a Saturday night. The old track was quickly removed, and the soil under it sufficiently to expose the supporting piers. The spans were then rolled into position one by one,

and the track connected up, the new viaduct being ready for use at 6 p.m. on Sunday, after a possession of 19 hr.

More Passenger Service Reductions

The Missouri-Kansas-Texas Railroad is seeking authority to abandon its passenger services over the 387 miles between Parsons (Kansas) and St. Louis, the 208 miles between Parsons and Oklahoma City, and the 176 miles between Granger and Houston (Texas). At present these lines are devoted mainly to freight, there being only one passenger train in each direction daily.

This will reduce passenger service to the principal main line only, from Kansas City to Parsons and Denison, the alternative routes through Dallas and Fort Worth respectively between Denison and Waco, and on from there to San Antonio, Texas.

The Boston & Maine similarly is pruning its timetable, to reduce the losses on passenger service.

WESTERN GERMANY

Electrification Progress

On January 15, electrification was inaugurated between Aschaffenburg and Frankfurt. With the conversion completed recently between Würzburg and Aschaffenburg, there is now through electric working between Frankfurt, Würzburg, Nuremberg, and Regensburg. Work is in hand on conversion between Regensburg and Passau, on the Austrian frontier, which will afford electric traction throughout from Frankfurt to Vienna.

In the next few weeks the electrifica-

tion work will be completed between Mainz and Remagen, on the left bank of the Rhine. Its extension beyond Remagen as far as Cologne and Düsseldorf is expected to be finished by 1959. Conversion is also in progress between Frankfurt (via Mainz-Bischofsheim) and Mainz.

Electrification of the main line along the right bank of the Rhine from Wiesbaden via Niederlahnstein to Cologne-Deutz is to be given high priority, as both left and right bank lines are considered, for operational reasons, as one quadruple main line.

Conversion is also here considered of the Ruhr-Sieg main line (Hagen-Siegen-Frankfurt) because of the many tunnels and steep gradients. Greater capacity on that line is essential, as it is a relief to both Rhine bank lines and an important link between the Ruhr, South Germany, and South-Eastern Europe.

Another urgent project is conversion of the congested double-track main line Hamburg/Bremen - Hanover - Fulda - Frankfurt/Gemünden. Its capacity could be much increased by electrification, mainly on the gradient portions between Göttingen and Gemünden or Frankfurt.

FRANCE

Passenger Traffic in 1957

During the peak 1957 holiday season in France, between June 27 and September 1, nearly 7,500,000 main-line passengers departed from the principal Paris termini, an increase of 2.93 per cent compared with the corresponding period in 1956.

Publications Received

Steam Locomotive Design, Part II. By R. H. Mann, Richmond, Surrey: The Association of Engineering & Shipbuilding Draughtsmen, Onslow Hall, Little Green. 8½ in. by 5½ in. 114 pp. Illustrated. Paper Covers. Price 6s.—This is the second and final part of the summary of information suitable for staff engaged in the design of steam locomotives. Valve gear, dynamics of locomotive components, auxiliaries and fittings, and tenders, are the subjects of this section. Part I was the subject of a brief notice in our January 3 issue.

Welding Handbook. Fourth Edition. Part 1: Basic Principles and Data. New York, 18: American Welding Society, 33, West 39 Street. London: Cleaver-Hume Press, Limited, 31, Wright's Lane, Kensington, W.8. 9½ in. by 6½ in. 564 pp. Price 72s.—In this fourth edition of the handbook of the American Welding Society, opportunity has been taken to divide it into five independent books, each on a single broad aspect. Alterations have also been made with a view to the speedy incorporation of new data to be published in the future. A feature of the book is the use of the "decimal"

method of page numbering for easy reference. Among the sections dealt with are the fundamentals of welding terms, properties and design of welded joints, and methods and inspection of welds. Safe practices in welding and cutting operations are also discussed. Bibliographies are appended to each section where applicable.

Cravens Limited.—A brochure of some 80 pages illustrating some of the coaches and wagons built by Cravens Limited, of Sheffield, has been issued by the company. It is based on a brochure issued in 1954, giving examples of rolling stock built by the firm since the war for railways in a number of countries. A supplement now has been issued, this describes some of the vehicles supplied to railways in this country and overseas during the past three years.

Dorman, Long Illustrated, 1957.—This well-illustrated booklet of 18 pages has been produced to describe some of the developments which have been made during 1957 by the Dorman, Long Organisation. Topics dealt with include the expansion of production at the Clarence Chemical Works, disposal of blast-furnace slag, the use of basic slag as fertiliser, the universal beam

mill at the Lackenby works, and some of the associated companies in this country and Africa. Copies may be obtained from Dorman, Long & Co. Ltd., Zetland Road, Middlesbrough.

Pneumatic Power Hammers with Slides.—A 12-page brochure has been issued by B. & S. Massey Limited of Openshaw, Manchester, which describes the range of pneumatic power hammers—all applicable to the railway industries—produced by the company. Dimensions of current designs are also included.

Crushing Rolls.—A catalogue of 20 pages describes the range of crushing rolls produced by Hadfields Limited, East Hecla Works, Sheffield. Machines for use with ore, macadam or ballast, fine products, ironstone, and so on are described and illustrated. Copies may be obtained from the company.

Calendars for 1958.—We have received calendars for 1958 from the Butterley Co. Ltd., Davey, Paxman & Co. Ltd., North British Locomotive Co. Ltd., Maschinenfabrik Augsburg, Nurnberg A.G., Soc. Alsthom, the Malayan Railway Administration, and Hadfields Limited.

Investigations into Hunting of Railway Vehicles

Prize entries in the competition arranged by the O.R.E., Utrecht

IN December, 1953, the Office for Research & Experiments (O.R.E.), at Utrecht, of the International Union of Railways (U.I.C.), proposed to the Committee of Management of the U.I.C. the holding of a competition, open to all research workers, for theoretical investigations relating to the hunting movement of railway vehicles.

The competition was launched during May, 1955. About 200 persons or institutions applied for particulars. Entries were closed in August, 1956, and 17 were received.

The terms of the competition were stated as follows:

"Solutions are required which are applicable to the problem of the hunting movements of rail vehicles, together with an example of the application of these methods to a simple design of vehicle. Rail vehicles are subject to a parasitic movement over and above their principal movement, even when running on perfect track. This parasitic movement can develop in many degrees of freedom. Two components of this movement, that transverse to the centre line of the track and that rotational about a vertical axis, have adverse effects on stability and riding comfort. In general, the combination of these two components is called hunting. Existing experience should be considered in this study, and applicants may use any of the publications on this subject."

After the study of the entries by the international jury appointed for the purpose, it appeared that only five entries warranted serious consideration, and at its meeting on June 12, 1957, the jury awarded three prizes. This award merely signified that the entries so rewarded did in fact conform with the conditions of the competition: none of them completely satisfied all aspects of the question posed, but they all gave solutions which merited further study.

The names of the winning entrants are: Professor R. de Possel, University of Algeria; Monsieur Jean Boutefoy, Traction Engineer, Société Alsthom, Paris; and the Railway Technical Research Institute of the Japanese National Railways, Tokyo.

The distribution of the prizes by Dr. Ir. F. Q. den Hollander, President of O.R.E., took place in Utrecht on July 11, 1957.

Summaries of the winning entries are given below.

Thesis by Professor R. de Possel

The following is a résumé of the entry by Professor R. de Possel:

As far as is known at present, the studies made so far on the hunting movement have examined in particular the case of linear friction and the conical type (the work, for example, of Monsieur Y. Rocard), the differential system being thus linear.

Retaining the hypothesis of linear friction, but assuming the rails and tyres to be worn, according to profiles analogous to those given in the competition conditions, it is possible to represent the various functions occurring in the equations by approximate expressions, in such a way that the system is still linear but has a different form.

The term in which the conicity of the tyre intervened, namely $\beta = \frac{b}{r}$, is replaced by an analogous term, which would take the value 0.463 for the given profiles. A supplementary term is added which arises from the variation of the direction of the perpendicular to the point of contact; this term causes another constant to intervene. The results differ appreciably from those obtained for a conical wheel, even in the case of a very slight hunting movement.

The hypothesis which compared the tyre to a cone appeared illusory to Professor de Possel, at least in the case of running in a straight line and in the case of a two-axle vehicle.

When the law of linear friction leads to stability, a small irregularity in the track will give rise to a hunting movement which will damp down very quickly, as shown by the study which he had made. In the opposite case, its amplitude will increase until the linear field is left and the movement will probably tend towards a periodic one, which is the limit of a system of equations corresponding to non-linear friction.

Four different flexions have been introduced to four contacts. It seems that equal flexions for each of the rails to the front wheel and the rear wheel had been considered up to now. These flexions only intervene by two linear combinations. Taking account of the rolling, the system is therefore of the eighth order. The stability of it has been studied in the numerical example proposed, at different speed. The results have been compared with those obtained in the particular cases where the flexions, the rolling movements, or both at the same time are disregarded. In the latter case the solutions of the linear system are stable up to quite high speeds, whereas for conical wheels instability at any speed in the rule.

The non-linear system obtained does not seem to us to enter again into the cases studied so far. It is, perhaps, possible to discover their limit cycles by numerical integration, but no time was available to pursue such an investigation far enough. Appropriate means of calculation would no doubt be necessary. In finding the equations, a strictly uniform rotation of the axles has not been assumed.

Finally, there probably exist periodical solutions of the problems with shocks of the flanges against the rails, but the equations arrived at seemed too complicated to discuss in the time avail-

able. The examination of worn rails has, however, led Professor Possel to think this process exceptional.

The extension of these results to the cases indicated the competition in conditions, such as dissymmetrical vehicles, to several axles or bogies, to running round curves, would not present difficulties, since the most important part of our results is relative to the case of a single axle.

Entry by M. Jean de Boutefoy

The study, by Monsieur Jean de Boutefoy, aimed at examining the influence of the flexibility of the vertical suspension on the stability on track of a railway vehicle. The flexibility of the vertical suspension influences the value of the "period of rolling movement." The internal damping of the suspension was disregarded.

The equations establishing the dynamic equilibrium of the system were worked out according to the method set out by Monsieur Rocard in *Actualités Scientifiques et Industrielles*, by assuming, as did that author, a linear relationship between the tangential force and the angle of "pseudoslip."

In considering the particular rail and tyre profiles proposed in the competition conditions, it was shown that it was necessary to attribute to the conicity of tyres the value of 0.4; the latter was defined as the relation between the variations in radius of a wheel and the value of the transversal displacement of the axle, which causes this variation in radius. It was also shown that as the areas of contact of the two wheels of an axle on the rails have not the same inclination on the horizontal, the supporting reactions have a transversal component which is not to be neglected and which tends to centre the axle in the track.

The application of "Hurwitz" stability conditions to this system has led to the definition of a "speed limit of stability" and to giving the value of it as a function of the principal parameters of the vehicle and of the characteristics of the track (wheelbase, moment of inertia, vertical flexibility of the suspension, period of rolling movement, conicity of the tyres, transversal stiffness of the track).

Endeavours were made to arrive at these results by means of an experimental study on a model two-axle wagon. Finally, the application of the method of calculation to the case of a bogie vehicle was considered.

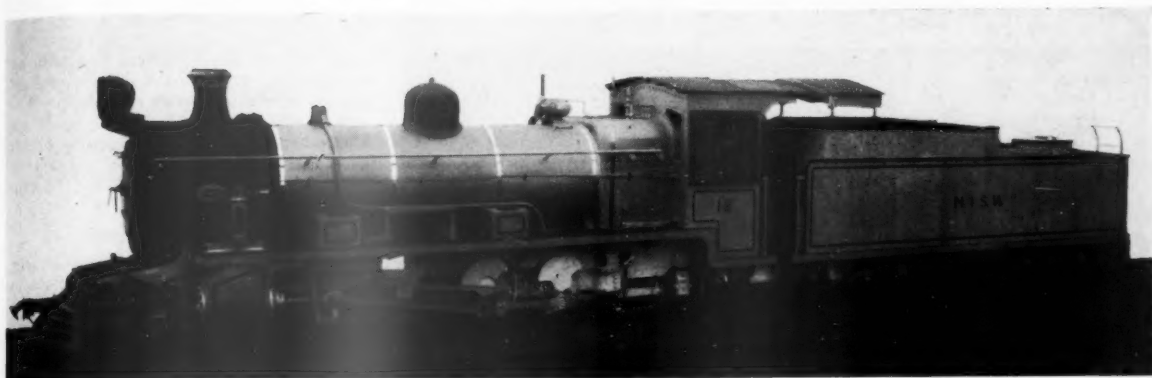
J.N.R. Technical Research Institute

The thesis by the Technical Research Institute of the Japanese National Railways is in two parts, theoretical and practical. The theoretical part can be summarised as follows: Hunting

(Continued on page 103)

Shunting Locomotive for Indian Steelworks

Tender design of 2-8-2 wheel arrangement for 2-ft. gauge



Bagnall-built 58-ton tender locomotive for shunting duties with tractive effort of 15,200 lb.

A TENDER locomotive of 2-8-2 wheel arrangement, designed for shunting operations, has recently been supplied to the Mysore Iron & Steel Works, India, by W. G. Bagnall Limited. It is one of several ordered for operation on the customer's 2-ft. gauge lines since the last war. The tractive effort at 85 per cent boiler pressure is some 15,200 lb.

Leading particulars are as follow:—

Gauge	2 ft.
Cylinder dia.	13½ in.
Cylinder stroke	18 in.
Driving wheel dia.	2 ft. 9 in.
Leading wheel dia.	1 ft. 8 in.
Trailing wheel dia.	1 ft. 8 in.
Rigid wheelbase (engine)	9 ft. 9 in.
Total wheelbase (engine and tender)	44 ft. 2½ in.
Maximum height	9 ft. 6 in.
Maximum width	7 ft.
Length over headstocks (engine and tender)	48 ft. 5½ in.
Heating surface of tubes	730 sq. ft.
Heating surface of firebox	68.5 sq. ft.
Heating surface of superheater	163 sq. ft.
Total heating surface (evap.)	798.5 sq. ft.
Grate area	117.1 sq. ft.
Working pressure	180 lb. per sq. in.
Tractive effort at 85 per cent b.p.	15,210 lb.
Adhesion: tractive effort ratio	3.78
Weight in working order (engine and tender)	58.05 tons
Minimum curve negotiable	191 ft. rad.

Boiler and Firebox

The boiler barrel, 12 ft. 9½ in. long, is of three-ring type, the smallest ring being 3 ft. 7½ in. dia.; ⅝ in. steel plates are used. Longitudinal seams are double-riveted butt joints, circumferential seams being single-riveted. The smokebox tubeplate is 1-in. thick. The firebox is of the Belpaire type; the shell is 5 ft. 5 in. long by 4 ft. ¾ in. wide, outside, at foundation ring. Top and side plates are ½-in. thick, the throat plate is ¾ in. thick and the back plate ⅞ in. thick. A mud collector is riveted to the underside of the second barrel.

The inside firebox of copper measures 4 ft. 9½ in. long by 3 ft. 5½ in. wide inside at the foundation ring; side and top plates are ½-in. thick, door plate ¾-in. thick, and tubeplate 1-in. thick around tube area, reduced below by hammering to ½ in. The two safety valves are 2½ in. Ross Pop type.

The 80 solid-drawn steel flue tubes

are 1½ in. o.d. by 11 g. swelled ⅛ in. in diameter at the smokebox end. The tubes are expanded in the tubeplates, and fitted with ferrules at the firebox end. Twelve superheater flue tubes, 5½ in. o.d. by 8 g. are fitted. They are beated over and welded at firebox end. An M.L.S. 12-element superheater header incorporating an anti-vacuum valve is fitted to the smokebox tubeplate.

The steel-plate smokebox incorporates a steam blower operated from the footplate by a handwheel. A spark arrester is arranged in the chimney. A cast iron double-valve regulator positioned in the dome, is operated by a rod connected to a handle on the boiler backplate.

Two Gresham & Craven No. 8 combination injectors are fitted on to the frame under the footplate.

Frames and Cylinders

Main frames are 1-in. thick steel plate braced by riveted cross stays. 1½-in. buffer beams are composed of two sections; a front and a hind beam which are 1-in. and ¾-in. thick respectively. D-type balanced slide valves are incorporated in the outside cylinders. Wheel centres are of tough cast steel, and axles are forged steel. The journals are 7¼ in. dia. × 6¼ in. Tyres are 2½ in. on tread by 4½ in. wide, shrunk on to wheel centres and secured by pegs.

Outside cranks are of forged steel, pressed on to axles and secured by keys. Cast bronze axleboxes have white-metal inserts for bearing faces.

The cab is of roomy design, having glass windows set in polished brass frames. Sliding shutters are provided at side of cab. The double roof has a large air space. Four fabricated steel sandboxes are provided, carried on the foot-framing, Lambert-type wet sanding apparatus being used. Buffers and couplers are of the A.B.C. design. A steam brake valve is arranged to operate on the coupled wheels of locomotive and all tender wheels.

Stone's electric lighting equipment is provided, consisting of one boiler-mounted turbo-generator, two Tonum E headlights, one water gauge light, one pressure gauge light, one cab and tender light, and the necessary control equipment.

The tender, which has a fuel capacity of 3 tons and 2,800 gal. of water, is carried on two two-axle plate frame bogies. Wheels are 1 ft. 8 in. dia., and journals 3½ in. dia. × 7 in. A forged steel draw-bar is fitted between engine and tender; safety links on either side of the draw-bar are also provided.

Principal sub-contractors are as follow:—

Boiler tubes	Universal Steel Tube Co. Ltd.
Flue tubes	Howell & Co. Ltd.
Superheater equipment	Superheater Co. Ltd.
Safety valves	R. L. Ross & Co. Ltd.
Injectors	Gresham & Craven Limited
Piston and valve rod	United States Metallic Packing Co. Ltd.
metallic packings	Packing Co. Ltd.
Locomotive couplers	A.B.C. Coupler & Engineering Co. Ltd.
Electric lighting equipment	J. Stone & Co. (Deptford) Ltd.

Investigations into Hunting of Railway Vehicles

(Concluded from page 102)

was studied first in an isolated axle, which is perfectly free, then, in a two-axle vehicle, with the following characteristics: (a) rolling of the body prevented; (b) no transversal deformation either of the rails or of the wheels; and (c) the axles making movements relative to the body which were limited by centering devices.

The equations used are only linear and do not take into account the effect of transversal centering causing the variations of the inclination of the tangential planes at the point of contact of wheel and rail. They are, therefore, valid only for the case where the wheels are perfectly conical.

The calculations lead to the determination of the limits of stability, taking into consideration connections between axles and body.

Remodelling of Ajmer Workshops, Western Railway of India—1

Provision of increased capacity necessitated by re-grouping of the railways and by the provisions of the Five Year Plan



Wheel park, looking east; production offices in background

THE metre-gauge central workshops of the former Bombay Baroda & Central India, now the Western Railway of India, were built in 1874. This had become necessary as a result of the completion of the metre-gauge main line from Delhi to Ajmer, and the development of the Malwa section the following year. Both schemes required additional rolling stock, and the capacity of the metre-gauge workshops at Agra fell far short of the expected requirements, and it was for this reason the Ajmer workshops were built.

Ample capacity was provided to cater for the needs of the metre-gauge section of the railway for some years, but with the further development of metre-gauge lines, repair capacity was increased by the building in 1887 of separate workshops at Ajmer for the repairs to carriages and wagons, thus leaving the original works to concentrate on locomotives only. In common with other railways in India during the ensuing years, new systems of production planning were introduced, and not only were the Ajmer workshops able to meet the normal demands of the railway, but capacity was available to build metre-gauge locomotives, and was, it is thought, the first Indian workshops to do so; more than 450 locomotives were built.

Re-Grouping of Railways

In 1951, certain metre-gauge systems were amalgamated with the former B.B.C.I.R. to form the metre-gauge system of the Western Railway. This added some 1,540 miles of metre-gauge track to the system, as well as considerably increasing the amount of rolling stock; at the same time, the respective railway workshops also were taken over by the Western Railway.

As a result of the intensive use of roll-

ing stock during the years 1939-46, the former B.B.C.I.R., like other railways in India, were faced with a heavy programme of rolling stock maintenance and renewals; and these, and developments during the First Five-Year Plan, and those anticipated during the Second Five-Year Plan, led to a detailed investigation into the possible remodelling of the Ajmer workshops to meet the increased repair capacity required. Furthermore, the workshops of the small systems formerly owned by the princely States, and now absorbed, were comparatively small units, and inadequately equipped, largely because of the difficulties of obtaining equipment during the war years.

Concurrently with these developments on the metre-gauge system, the Western Railway broad-gauge locomotive repair shops at Dohad are being remodelled

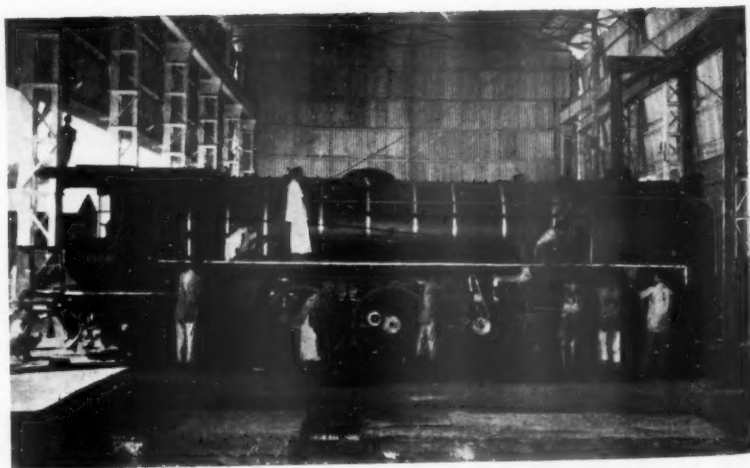
at a cost of Rs. 45 lakhs, and will, on completion, represent a 60 per cent increase in existing repair capacity; it is anticipated that when the proposals are implemented, the Dohad shops will meet the assessed repair load expected to materialise by the end of the Second Five-Year Plan.

Metre-Gauge Repairs

With the object of overtaking the accumulated deficit in heavy repairs to metre-gauge locomotives, building of new engines was discontinued at Ajmer in 1950. Even so, the present locomotive repair load is far in excess of the available repair capacity, and the remodelling of the workshops which will increase the capacity by some 30 per cent has been put in hand, also estimated at Rs. 45 lakhs. The berthing capacity in the erecting shop has been increased by the provision of a new stripping shop with heated cleaning tanks for the cleaning of locomotive components. A 50-ton electric overhead travelling crane is also installed, while further track space is being provided by extending the erecting shop to the north-east; this is served by the existing 30-ton electric overhead cranes.

The boiler shop has constituted a bottleneck because of the restricted crane travel in some of the bays, and the absence of a boiler park with crane facilities where boilers, both repaired, and waiting repairs, can conveniently be kept. To overcome this problem, crane travel in two bays has been extended, and a boiler park, with a 30-ton electric overhead crane, has been provided to the east of the existing boiler shops.

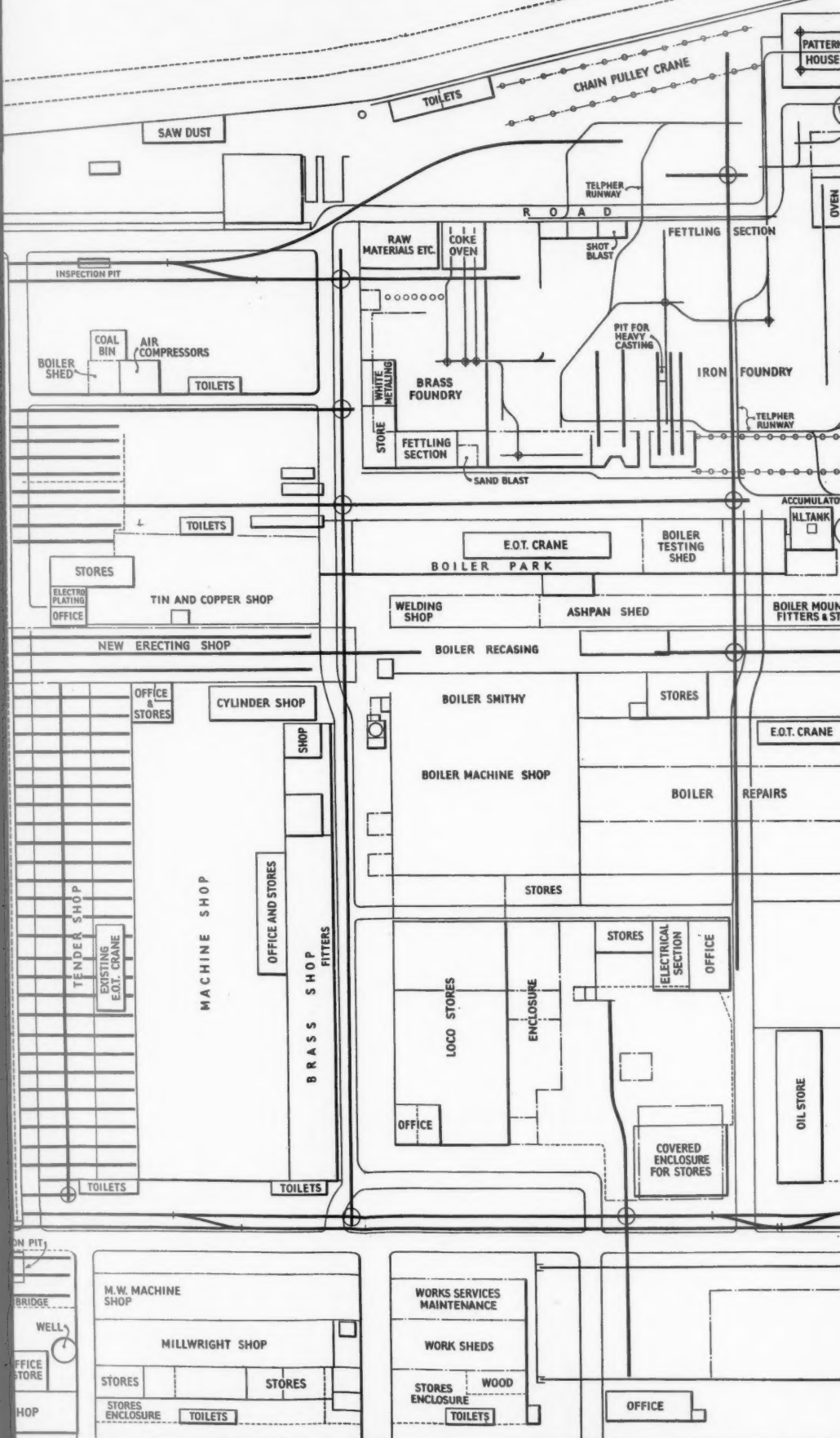
The fitting shop was previously very congested, and left no scope for expansion, unless the wheel shop which was crammed in three bays of the fitting



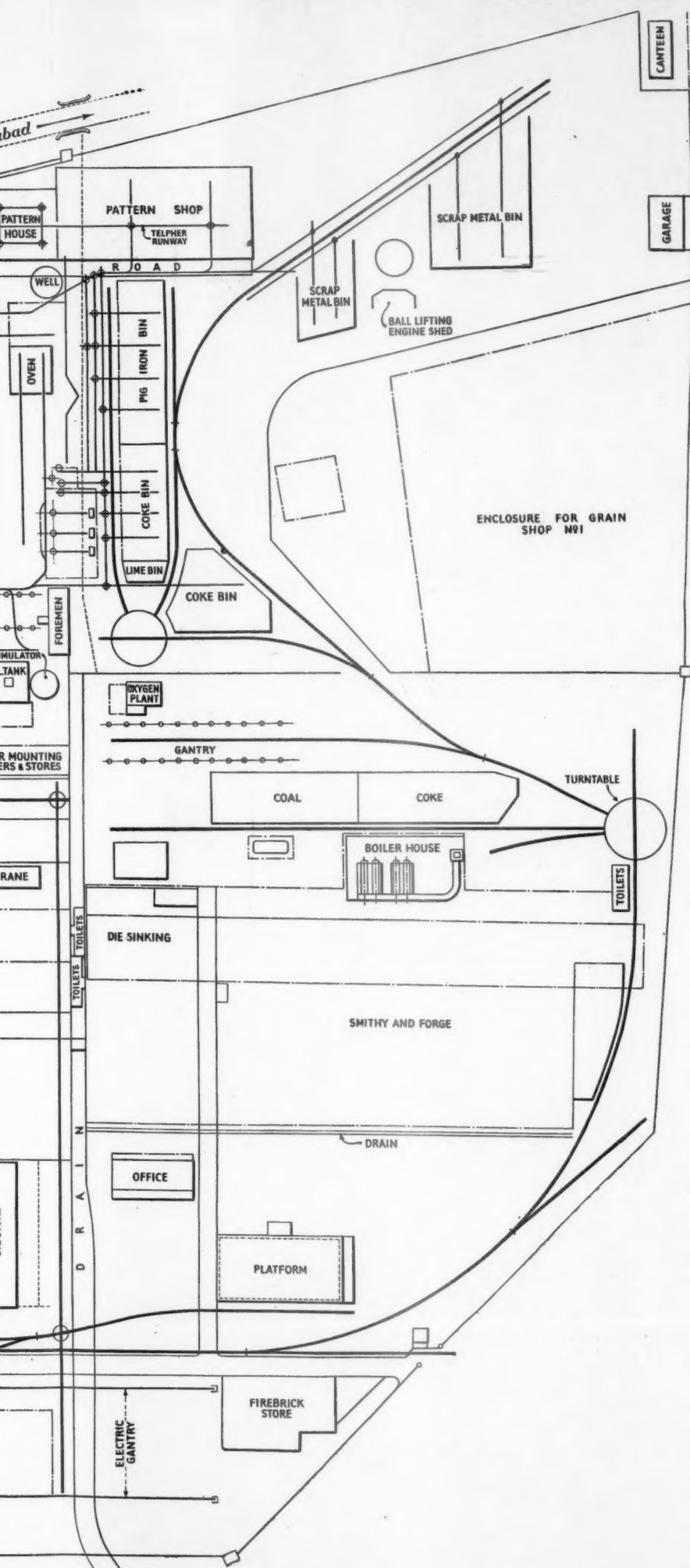
Interior of stripping shop, showing "YP" class locomotive

300 FEET

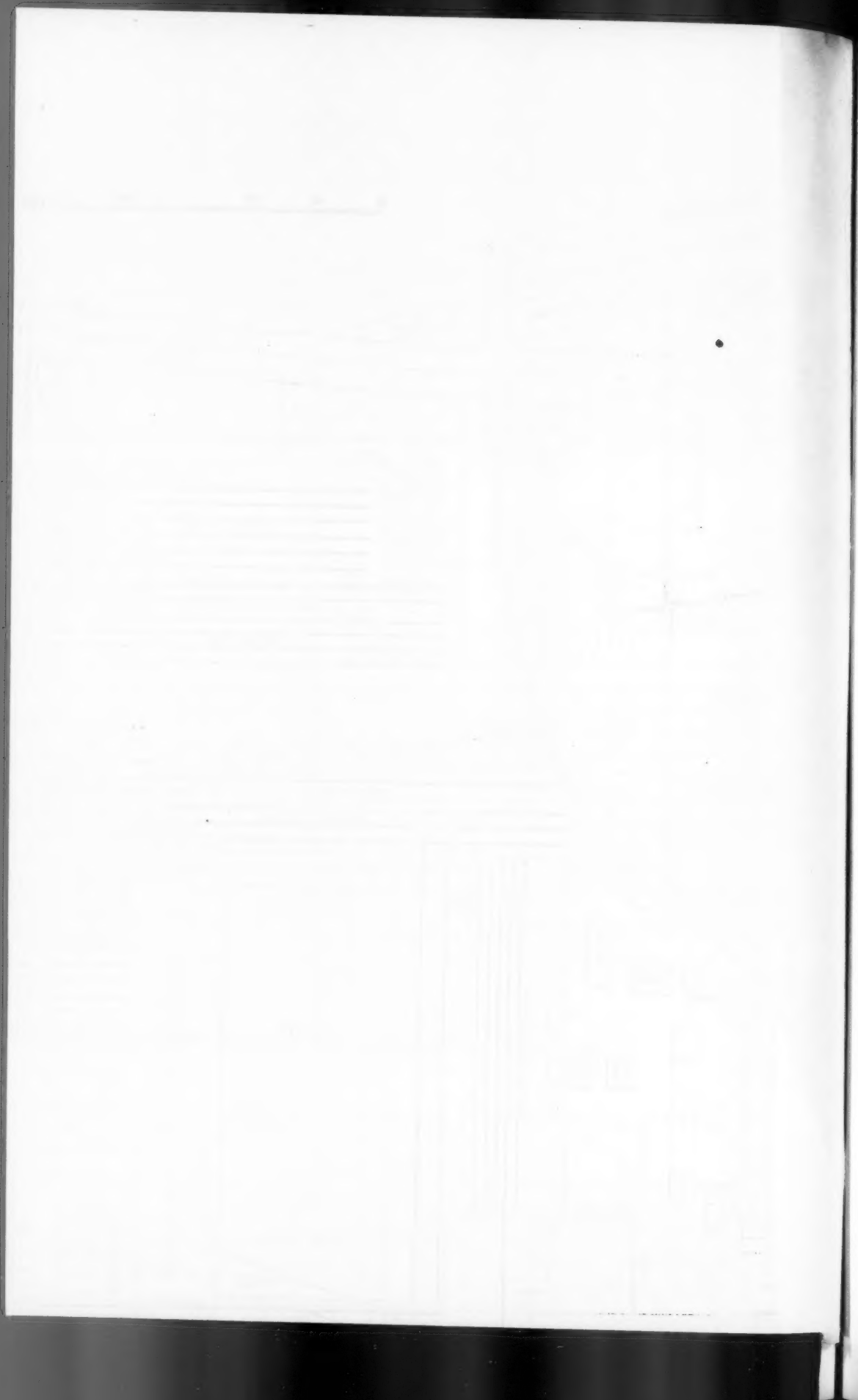
To Nasirabad



LOCOMOTIVE REPAIR SHOPS, WESTERN RAILWAY, INDIA, A



A, AFTER REMODELLING



shop were resited; fitting and the incidental work was carried out in a lean-to shed to the north, and along the length of the fitting shop. It was therefore decided to remove the wheel shop and expand the fitting shop in the area previously occupied by the wheel shop machinery. The lean-to shed has been demolished and a new wheel shop, 380 ft. long by 50 ft. wide, will be built.

Wheels and Axles

Advantage has been taken to provide a layout by which repairs to wheels and axles are carried out on a progressive system. The shop is served by a five-ton electric overhead crane with a one-ton auxiliary hoist. A wheel park for the storage of spare wheels, tyres, and axles, has been provided alongside the wheel shop and running its entire length, the whole area will be served by a three-ton electric overhead crane.

The machine shop was congested and its expansion hampered by the tool room which is adjacent to it; neither was the tool room capable of extension. The tool room therefore was transferred to that portion of the fitting shop previously given over to the reclamation of materials section. New equipment provided includes a jig borer, and a projector; these are required in connection with the considerable expansion of jigs and fixtures being undertaken.

The resiting of the tool room provides scope for the expansion of the machine shop. A portion only of the machine shop is provided with north light, and this arrangement has been extended throughout the shop with Perspex sheeting on the roof every 15 ft., with the object of improving the general lighting. A centrally-located foreman's office, with tool store on the ground floor was planned, the resiting of which will, it is expected, provide additional, much-needed track capacity in the tender shop.

Foundry Output

The output in the ferrous and non-ferrous foundries was formerly in the order of 125 and 40 tons a month respectively, and it is estimated that production must be stepped up to 75 per cent to cope adequately with the anticipated increase in locomotive, carriage, and wagon repairs. The expansion of the brass foundry was hampered by both the pattern shop and iron foundry, and remodelling proposals embody a new pattern shop, resiting of the brass



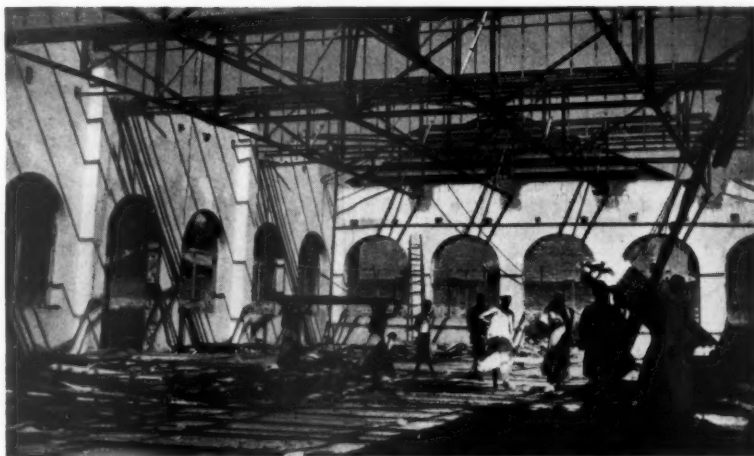
New reclamation section

foundry, and iron foundry cupolas, provision of a non-ferrous store and laboratory. Auxiliary shops including the tin, copper, brass-finishing, millwrights, and electrical shops, have also been developed. It is also intended to develop mechanical handling to the fullest extent, including internal transport by the extensive introduction of diesel-operated platform trucks and stillages for the inter-shop transfer of components.

Besides the remodelling of the Ajmer locomotive works, it is also intended to

develop the Jaipur shops with the object of increasing the present output by 10 intermediate repairs, and to erect a new locomotive shop at Rajkot, to increase engine output by nine heavy and intermediate repairs a month. The estimated expenditure at Rajkot is approximately Rs. 4 crores, which will include provision for carriage overhauls. The Baroda State narrow-gauge railway was merged with the B.B.C.I.R. in 1947; the workshops at Pratapnagar deal with all repairs to the narrow-gauge stock.

(To be continued)



Pattern shop under construction, before installation of telfer runway

BERLIN TRAINS DELAYED AT INTERZONAL BORDER.—The Russian authorities in Eastern Germany stopped British and U.S.A. military trains at the interzonal border on January 14, and demanded a new method of documentary control for passengers. Two British trains between Berlin and Hanover, and four American trains were stopped. Normal working was resumed later.

SCHEME TO IMPROVE PUNCTUALITY OF GREEN LINE COACHES.—In an attempt to improve the punctuality of Green Line

coaches, London Transport is to withdraw experimentally a number of little-used request stops, mainly in the outer areas, on three routes to give the drivers more time to cross central London. The experiment began on January 22. The three Green Line routes affected are 709, Godstone-Chesham; 710, Crawley-Amersham; and 711, Reigate-High Wycombe.

STATION FIRE CAUSED BY THIEVES.—A fire which extensively damaged the station buildings and signal cables at Deptford,

Southern Region, British Railways, on January 15, is believed to have been caused by thieves who broke into a booking office. A porter discovered the fire in the early morning. Until 8 a.m. there were no trains between Westcombe Park, Maze Hill, Greenwich, Deptford, and London Bridge. Services were resumed with hand signalling, but trains did not stop at Deptford. When the fire was under control it was discovered that the ticket office on the up platform, in which the fire had started, had been broken into. The office contained the station safe.

Electronic System of Vehicle Identification

Apparatus to read numbers from reflector panels and transmit information to a central point

FOR many years there have been attempts to evolve a system which would identify a railway wagon and transmit the information to a central point. In this way, the progress of a wagon from stage to stage of its journey could be followed and traders could be told exactly where the wagon was. This would answer one prevalent complaint—that a consignment in transit by road is never "lost," because the driver of the vehicle on which it travels has to report at various places during his journey, whereas once a railway wagon has been despatched there is no record of it until it arrives at its destination.

A system evolved by London Transport for identifying buses, and now being tested on one route, seems to have possibilities for railway purposes, and might, if suitably modified, provide an answer to the railway problem stated above. The main difficulty in operating a regular bus service through the congested streets of a city is lack of knowledge of the whereabouts of individual

buses at any given time, and of whether acute congestion has built up in any particular area.

The Operating Department of London Transport approached the Electrical Engineering Department to see if any method could be developed at a reasonable cost to give a central control point a picture of the services. The result has been the development of the Bus Electronic Scanning Indicator (B.E.S.I.).

To give a complete picture of London Transport bus operation entails the tracing of some 7,000 buses operating on some 500 routes; moreover, to be of maximum value to the operating staff, it is desirable that any individual bus can be traced by its running number.

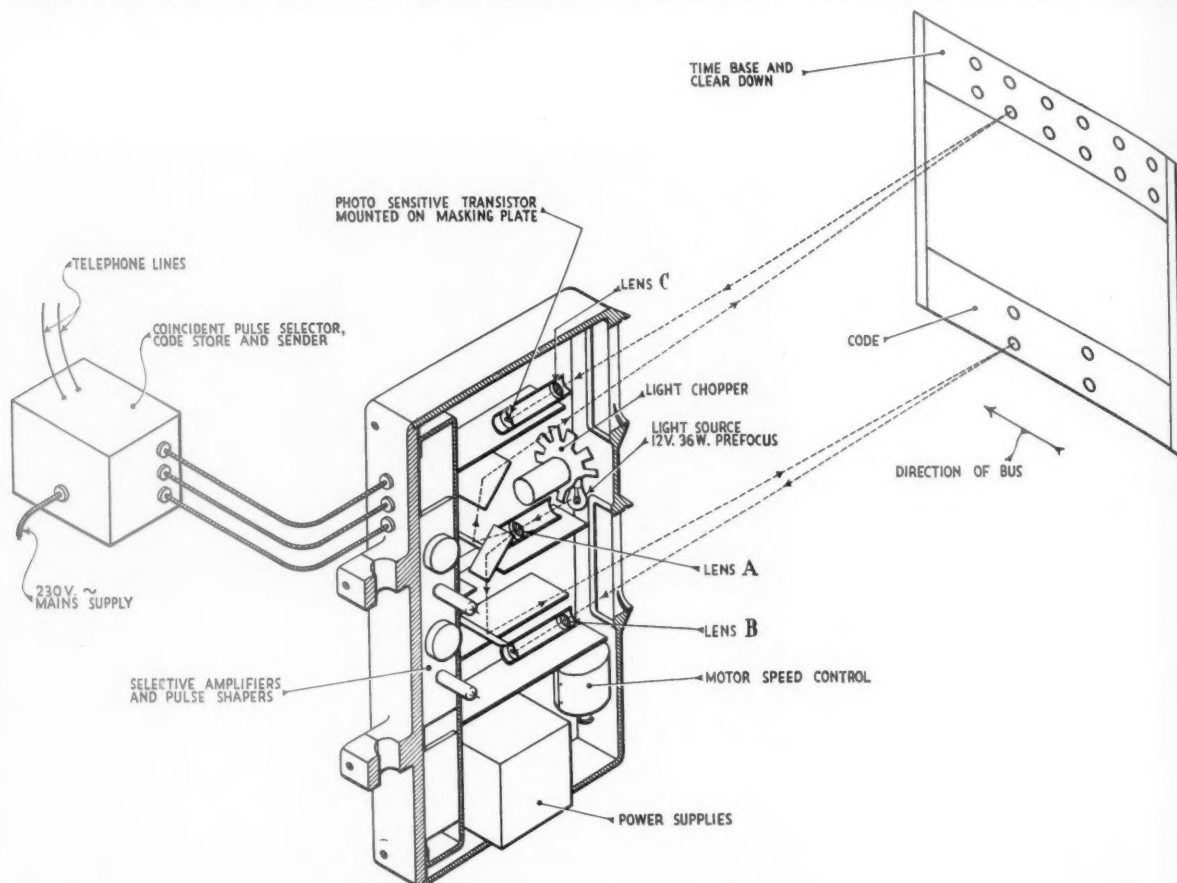
Alternative Schemes

A variety of schemes has been tried out, including magnetic scanning and local radio intercommunication, but bearing in mind the cost of covering the whole of the L.T.E. area, a simple optical system has finally been chosen.

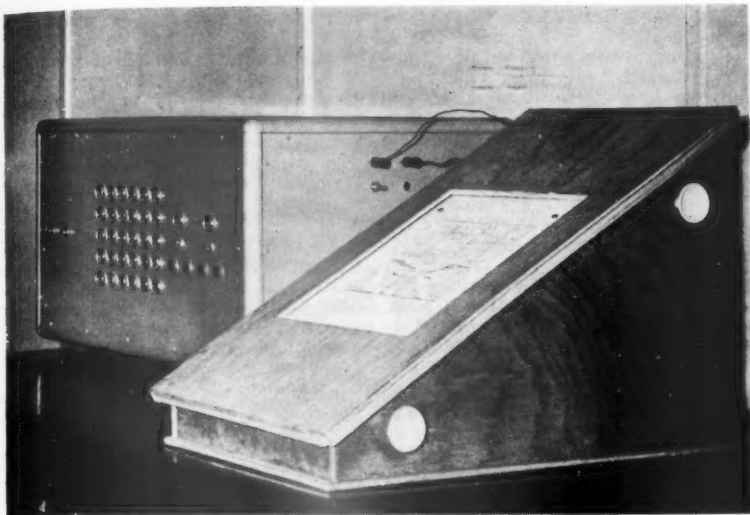
The scheme now in process of development consists of a number of check points along each route at which electronic equipment reads the number of each bus as it passes and transmits it over telephone wires to a central location, where it is displayed on a panel and finally will be recorded on a chart. When each bus passes the next check point the number will be recorded on another panel and cancelled on the first, so that in effect each panel will contain the running number of each bus between the two boundary check points.

Numerically, the largest item will be the equipment necessary on each of the 7,000 buses, and for this reason this item has been designed so as to be as cheap as possible; moreover, equipment on a moving bus is difficult to maintain, so that it was decided that only a form of reflecting plate would be suitable.

Financially, the largest obstacle could be the telephone cables to the scanning



Electronic scanning unit of the B.E.S.I. system, showing paths of two beams of light projected to, and reflected back from, the reflecting plate on the vehicle



Illuminated control panel of the identification system

points; London Transport, however, has a widespread private telephone network, particularly on its railway system. There may be occasional points which can only be dealt with economically by the hiring of Post Office lines, and therefore the equipment must be designed so as not to interfere with other telephone users.

Other important factors that had to be considered in the design of the system were the need to facilitate quick and easy route and running number changes and to ensure that the bus equipment in no circumstances would interfere with the ordinary functioning of the bus, or its crew. Also, the roadside equipment had to be easily installed and maintained, and the system should be capable of being operated by day and by night, over a range of bus speeds up to 30 m.p.h.

Pilot System

A pilot system is now being tried out in service on the No. 74 bus route. Each bus running number has been coded into a binary number and this has been reproduced on a plate containing reflectors for each digit, and a corresponding blank for each zero. The plate has been placed on the nearside of the bus towards the front, above the driver's cab.

The scanning equipment has been erected at the same height as the bus plate and as near as possible to the roadway, either on a post at the pavement edge or, where the pavement is narrow, on a convenient point on the building line.

The equipment consists of a source of modulated light focused on the plates of the buses, and a further optical system to receive back the reflected light. As each reflector passes through the beam of light, the reflected light falls on to a photo-electric cell, the result being an intermittent flow of current still modulated by the source of light. The required

signals can therefore be filtered out, amplified and formed to a wave shape suitable for transmission over the connecting telephone wires.

At the control point, the incoming pulses operate relays which will build up the binary number of the bus, and when completed, will close the circuit, causing the actual running number to be illuminated on the check point display panel. The panels of each check point are so wired that as each number comes up on one panel, the number on the previous panel is cancelled.

Reflecting Plate

The equipment on the bus consists of a plate containing reflectors representing the running number of the bus in binary form. Several problems had to

be met in the design of this plate. There is the difficulty of recording buses travelling at any speed from 1–30 m.p.h.; there is the variation in the height of the reflectors caused by the loading of the bus, and also the variation of angle of the reflectors from the vertical caused by the position of the bus on the camber of the road as it passes the scanner. Added to the above is the requirement that the plates must be of reasonable size, not only for handling purposes—as they are changed every time a bus alters its running number—but also because there is little space on the bus not already occupied by destination blinds, advertising spaces and windows. Moreover, the plates must be placed at a height well above the level of pedestrians on the pavement and, maybe, cars parked at the kerb.

The most suitable form of reflector has been found to be the type used for road signs, generally referred to as "cat's eyes." These are $\frac{1}{4}$ -in. in dia. and can be designed for a very narrow reflecting field and negligible scatter.

To compensate for varying speeds, the plate is produced in two parts, the upper half being a complete row of reflectors to form a timing base—plus one additional one at the end to act as a clear down unit. The lower half is placed 10 in. lower, and exactly in line vertically is the binary code plate. The horizontal spacing between each reflector is 2 in., which has been found satisfactory for timing purposes up to at least 40 m.p.h., leaving a reasonable margin for normal bus operation. To compensate for both loading and camber, the reflectors are mounted in pairs, one above the other, at a centre distance of 1 in.

These plates are fitted towards the front of the bus on the nearside, above the driving cab, and are fitted into



Reflector plate on side of London Transport bus, showing the cat's eye reflectors which form the code and time base

slots, and in this position will not interfere with mechanical washing equipment or with normal operation.

Scanning Equipment

At each check point scanning equipment must be installed at each side of the road to register the flow of buses, and must be so mounted that the buses pass within about 12 ft. of it, as beyond this distance the angular displacement of the light becomes increasingly difficult to accommodate. In addition, if the distance from the kerb becomes too great, there is the danger of a parked lorry completely masking the scanner. Sites chosen, therefore, are places where the road is narrow, or its width restricted by a pedestrian island. As the scanner unit itself may need to be pole mounted, this must be made as small and light as possible. The relays and other circuit equipment must then be mounted in suitable positions as near as possible, either within a building or, if necessary, in a cabinet mounted on the pavement.

The scanner must be designed to reject all signals other than those contained in the reflectors, particularly the gold lettering and other reflecting vertical lines often seen on trade vehicles. It must also work in bright sunlight as well as on dark nights. In fog, it is hoped that it will operate as long as the buses themselves.

The scanner has a light source consisting of a 12 V., 36 W. lamp, which is focused by lenses and passed through slots on a rotating disc. The number of slots and the speed of rotation result in the light being broken up into 3,000 impulses a second. These impulses of light are passed to two mirrors set at right angles, which divide the beam into two, and by further mirrors they deflect on to the time base plate and the coding plate respectively.

The light reflected from these plates passes back into the scanner and is focused on to two photo-sensitive transistors which transform the light impulses into electrical impulses, still at 3,000 a second, which are then passed to resonant amplifiers. These reject the effect of all extraneous incoming light not associated with that sent out by the instrument lamp at the controlled frequency, and therefore not part of the bus identification.

Neither the 3,000-cycle modulation nor the wave form of the resulting signals would be suitable for operating the telephone-type circuits which follow, so they are passed into pulse-shaping transformers where a square wave-shaped pulse is produced from each signal from the reflectors. The pulses from the time base plate are now paired with those of the code plate by feeding them to cold cathode valves, and when both time base and code valves fire together, relays are operated, thus storing the code so formed.

As at least two scanners and possibly more in busy traffic centres, will share the telephone line to the control centre, the code is stored by the relays mentioned above. These are released in turn over the line as pulses similar to those experienced when dialling a normal telephone subscriber instrument, except that the number will still be in binary form.

The control centre will have a series of panels, one for each scanner position. These panels will have a display of lamps, each lamp having printed on it the running number of a bus operating on the route being scanned. As each bus progresses from scanning point to scanning point, so the lamps will light up, signifying between which pair of scanners the bus is located at any instant of time.

In addition to lighting the indicating

lamp, a pen mark can be made on a chart moving forward on a scale of time, forming a permanent record of the time each bus enters the section, and hence the regularity of the service; alternatively, the information can be recorded in punched tape form. It is this recording feature which would seem to have railway possibilities.

Control Circuit

There is little of technical novelty in the circuit used at the control centre. The stored binary number at the scanning point is fed into the line as soon as a clear channel is available by normal pulsing procedure, and the pulses are again stored on relays at the centre, and when built up, energise the lamp with the running number corresponding to the code.

The characteristic of the final relay illuminating the lamp is designed so that if two lamps are in circuit at the same time, as when a bus passes from one scanning zone to another, the current demand causes the voltage to drop and the previously energised relay drops off, leaving the subsequent relay in charge and only the single up-to-date indication left on the appropriate panel.

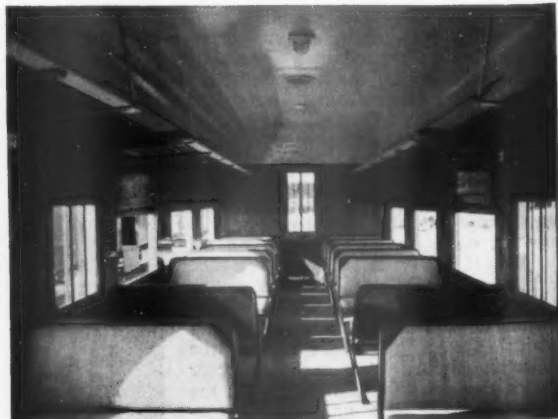
The equipment is in its primary development stage and there will no doubt be many improvements to be made over the next few months, but it is confidently expected that it will at least enable some improvement in bus service regularity to be achieved in spite of the difficult conditions which have arisen as a result of street congestion.

The whole of the equipment has been designed and developed at the Executive's Electrical Testing Section at Wood Lane, under the direction of Mr. T. S. Pick, the Chief Electrical Engineer. The electronic bus scanning device is covered by provisional patent application No. 33758/57.

Rolling Stock for Iraqi State Railways



Steel third class coaches built by Ferrostaal A. G. of Dusseldorf for the Iraqi State Railways



Interior of third class coach, showing general layout and arrangement of lighting fixtures

RAILWAY NEWS SECTION

PERSONAL

Sir Arthur Kirby has assumed his duties as Commissioner for East Africa in London.

Mr. Karnail Singh, Member (Engineering), Railway Board, Government of India, has been elected a Member of the Institution of Civil Engineers.

Mr. F. G. Manning, A.S.A.A., who, as recorded in our January 3 issue, has been appointed Contracts Officer, Central Services of the British Transport Commission, joined the B.T.C. early in 1948 for special duties connected with the acquisition of road haulage undertakings; he was also concerned in negotiations arising from the

Dr. jur. Alfred Genest, Chief of the Legal Department of the German Federal Railways, has retired.

The title of Directeur Général Honoraire de la S.N.C.F. has been conferred on Mr. A. Porchez, Directeur Général Adjoint of the Société Nationale des Chemins de Fer Française, who has retired. Mr. P. Maurois, Directeur Commercial of the same system, has also retired.

Mr. W. Dunsmuir, M.I.Loco.E., Assistant Motive Power Superintendent, Scottish Region, British Railways, who, as recorded in our December 27 issue, retired on December 14, has completed 50 years of service. Mr. Dunsmuir joined the Locomotive

The Hon. Michael Moohan has been appointed Minister of Railways, New Zealand. The Hon. Michael Moohan, who was born in Ireland, is 59. He was articled to the engineering trade in Manchester and, on completion of his apprenticeship, joined the Royal Engineers. He was closely associated with the trade union movement and the Labour Party in England and, on arrival in New Zealand in 1936, joined the technical staff of the Post & Telegraph Department.

Mr. A. Forester Fielding, E.R.D., M.Inst.T., who, as recorded in our January 10 issue, has been appointed Assistant Divisional Operating Superintendent, Derby, London Midland Region, British Railways,



Mr. F. G. Manning

Appointed Contracts Officer, Central Services of the B.T.C.



Mr. W. Dunsmuir

Assistant Motive Power Superintendent, Scottish Region, 1951-57



Mr. A. Forester Fielding

Appointed Assistant Divisional Operating Superintendent, Derby, L.M. Region

purchase of road passenger undertakings. In 1956 he was appointed Administration Officer in the Funds & General Division of the Finance Department of the Commission, later becoming Assistant Director, General Matters. Before joining the Commission's service, Mr. Manning, following 12 years' experience with London practising accountants and a period in commerce, and war service, was a senior investigator at the Ministry of Transport, being engaged in the settlement of accounts of road hauliers controlled during the war.

The following appointments in the Canadian Pacific Railway's freight traffic organisation affecting Montreal, Toronto and Winnipeg, have been announced: Mr. Norman F. Cowie, Assistant Freight Traffic Manager, Prairie region, Winnipeg, has been appointed Assistant Freight Traffic Manager, System, Rates & Divisions, Montreal; Mr. C. S. Doupe, Montreal, is appointed Assistant Freight Traffic Manager, Prairie region, Winnipeg; Mr. John Swinarton, Toronto, is appointed General Freight Agent, Montreal, with supervision over Quebec and New Brunswick districts, succeeding Mr. Doupe; and Mr. E. M. Scully, Assistant General Freight Agent, Montreal, becomes General Freight Agent, Rates & Divisions, Eastern Region, Montreal.

department of the Caledonian Railway in 1907 at Polmadie, receiving his technical training there and at St. Rollox Works and the Glasgow Technical College. In 1929 he was appointed Head Office Inspector (Motive Power), London, Midland & Scottish Railway (Northern Division), Glasgow, and in 1933 went to Carlisle (Kingmoor) as Foreman Fitter. While at Carlisle he occupied temporarily the position of Assistant to the late Mr. Ernest Booth, District Locomotive Superintendent at Durranshill. In 1938 Mr. Dunsmuir went to Aberdeen as District Locomotive Foreman and, the following year, was appointed District Locomotive Superintendent, Inverness (also in charge of the Chief Mechanical Engineer's, Carriage & Wagon, and Road Motor Departments for the Inverness area). In 1943 he became District Locomotive Superintendent, Perth, and, two years later, Assistant (Motive Power Maintenance) to Operating Manager, Glasgow. On nationalisation he was appointed Assistant (Maintenance) to Motive Power Superintendent, Scottish Region, Glasgow. He became District Motive Power Superintendent, Burntisland, in 1949, and District Motive Power Superintendent, Glasgow (North), a year later, before taking up the appointment of Assistant Motive Power Superintendent, Scottish Region, in 1951.

was born in Hong Kong, and spent his early life abroad. He was educated at Derby School and began his career with the former Midland Railway on March 14, 1921. After training at stations and in the Chief General Superintendent's Staff Office at Derby he entered the Control organisation at Chaddesden in 1926. In 1928 he was appointed to the Relief Staff and, in 1930, was promoted to be Assistant District Signalmen's Inspector at Saltley. In 1932 he became District Signalmen's Inspector at Cudworth and, the following year, returned to the office of the Divisional Superintendent of Operation, Derby, as a member of the Shunting Analysis Commission. In 1934, he was appointed Runner to the Divisional Superintendent of Operation, Manchester. In December the following year he was promoted to be Assistant District Controller at Huddersfield. In 1939 he was recalled from the Regular Army Reserve of Officers to The Sherwood Foresters in which he held the rank of Captain. He went to France commanding a Company of the 2nd Battalion, The Sherwood Foresters, and, from December, 1939, to April, 1940, held various staff appointments and was for a time Acting D.A.Q.M.G. (Movements) L. of C. Sub-Area Headquarters, Cherbourg. He took part in the advance to the River Dyle, near Brussels, in 1940 and,



Mr. A. E. Marriott

District Goods Manager (London City),
Eastern Region, 1948-57



Mr. John Buchan

Appointed General Express Agent, London,
Canadian National Railways



Mr. F. R. Sheppard

Appointed Group Sales Manager (Railways),
John Bull Group

while commanding a rearguard Company in the withdrawal, was taken prisoner. He spent the next five years in various P.O.W. camps in Germany and Poland until released by the 3rd American Army in April, 1945. While a prisoner of war he inaugurated and was Chairman of the Oflag 6 B Group of the Institute of Transport and it was during this time that he became an Associate Member of that Institute. Mr. Forester Fielding resumed his railway duties in September, 1945, as Assistant Divisional Controller (Freight Services), Manchester, and in 1946 was transferred to Rotherham to help introduce the District Operating Manager's organisation there. He became Assistant District Operating Manager in that organisation in August, 1946. In 1948 he was appointed District Operating Manager, Wakefield, London Midland Region, a position later re-designated District Operating Superintendent. He became District Operating Superintendent, Leeds, in 1950 and District Operating Superintendent, Leicester, in 1953, the position he now vacates. Mr. Fielding was the Operating member of a team of consultants which visited Rhodesia under the chairmanship of Sir Robert Inglis to report upon Rhodesia Railways. He is Vice-Chairman of the East Midlands Section of the Institute of Transport and a Fellow of the Permanent Way Institution. Until recently he was Commander of 18 Railway Group R.E. (A.E.R.), with the rank of Colonel and now holds a Colonel's appointment in the Staff Pool.

Mr. A. E. Marriott, District Goods Manager (London City), Eastern Region, British Railways, who, as recorded in our January 3 issue, retired on December 31, had served the railways for more than 42 years. Mr. Marriott began his career with the London & North Western Railway in June, 1915, in the Manchester district where he gained experience in the goods, passenger and operating departments. In 1921 he was transferred to Euston and served in the cartage, development and research departments before Assistant District Goods & Passenger Manager, Leicester, in 1934. He was appointed Assistant District Goods Manager, Broad Street, in 1943 and later became District Goods & Passenger Manager

at Northampton. In 1947 he returned to Euston as Claims Assistant to the Chief Commercial Manager. In 1948, Mr. Marriott became London City Manager, Eastern Region, a position later re-designated District Goods Manager (London City), the appointment he now relinquishes. During his tenure of office he has served on the Transportation Committee of the London Chamber of Commerce, the Winter Transport Emergency Committee, and many Railway Clearing House meetings. Mr. Marriott is a Member of the Institute of Transport and a Freeman of the City of London.

Mr. John Buchan, General Agent, Express in London for Canadian National Railways, who, as recorded in our January 17 issue, has been appointed General Express Agent, will have responsibility for C.N.R. operations in the United Kingdom, Eire, and the Continent. Mr. Buchan was born in Glasgow in 1894 and joined the C.N.R. there in November, 1912. After service in London and Liverpool he was promoted to be Express Agent in London in March, 1924, and became General Agent, Express, the position he now vacates, in April, 1947.

This C.N.R. appointment and the two others briefly recorded with it in our January 17 issue, have resulted from a change in company policy which establishes the Express Department as one reporting direct to the European General Manager, Mr. J. C. Kenkel.

Mr. George S. Cowie, Treasurer of Canadian National Railways, has retired. Mr. Cowie, who was born in Insh, Scotland, received his early training with several branches of the North of Scotland Bank before he became Chief Clerk in the treasurer's office of the Canadian Government Merchant Marine and Grand Trunk Pacific Coast Steamships at Toronto in 1921. He went to Montreal in 1923 as Assistant Treasurer of the C.G.M.M. and was appointed Assistant Treasurer to the C.N.R. in 1929. He assumed the same duties with T.C.A. on its inception in 1937. In 1952 he became Treasurer of both companies.

Mr. Edgar J. Denyar, Assistant Treasurer of Canadian National Railways, has been

appointed Treasurer of that system succeeding Mr. George S. Cowie, whose retirement is recorded above.

Mr. F. E. Sheppard, B.Sc. (Eng.), A.M.I.Mech.E., M.I.Loco.E., who, as recorded in our January 3 issue, has been appointed to the new position of Group Sales Manager (Railways) for the John Bull Group, will be responsible for sales of components and assemblies designed for use in railway equipment and permanent way installations. Mr. Sheppard, who received his degree from London University, trained for eight years in the works and drawing offices of the Great Western Railway at Swindon. For 14 years Mr. Sheppard served with the Assam Railways, first as Assistant and later as Chief Mechanical Engineer. Following this he held the appointment of District Locomotive Superintendent with the Nigerian Railways. He returned to this country in 1950 to join British Timken Limited in that company's then new Railway Division. He joined the John Bull organisation in 1956.

Mr. F. G. Crabb, Commercial Officer (Headquarters), Eastern Region, British Railways, has been appointed by the Minister of Transport to be a Member of the Transport Users' Consultative Committee for the London Area in place of Mr. E. W. Arkle.

Mr. T. Tulloch, Docks Manager, Fleetwood, Eastern Region, British Railways, has been appointed Shipping & Port Superintendent, Parkeston Quay, in succession to Mr. S. A. Claydon, who was recently appointed Continental Traffic & Shipping Manager, Eastern Region, Liverpool Street.

Mr. A. E. Hoare, Assistant Motive Power Superintendent, Southern Region, British Railways, has been appointed Mechanical Engineering Assistant, Chief Mechanical & Electrical Engineer's Department of that Region, with effect from January 16.

Mr. D. Beattie, Assistant District Commercial Manager, Derby, London Midland Region, British Railways, has been appointed District Commercial Officer, Norwich, one of the first appointments under the new Eastern Region traffic organisation. Mr.

C. V. Barrett, Assistant District Operating Superintendent, Cambridge, has been appointed District Operating Superintendent, Norwich, under the same scheme.

Mr. G. Hubert Jones, Assistant Railway Superintendent, of the Manchester Ship Canal Company since 1953, has been appointed to succeed Mr. W. Heywood as Railway Superintendent of that company.

Mr. F. R. Reeves, Traffic Superintendent (Operating), London District Office, South Eastern Division, British Road Services, has been appointed District Manager, East Anglia, South Eastern Division.

Mr. E. T. Croker, District Traffic Superintendent, Gloucester, Western Division, British Road Services, has been appointed District Manager, Gloucester. He succeeds Mr. T. W. Thomas, who has relinquished that appointment because of ill-health.

Mr. J. A. Neale has been appointed a Principal Executive Assistant in the office of the Recruitment & Training Officer of the London Transport Executive. He will be responsible for the headquarters sections concerned with training and education, recruitment and promotion of administrative and technical staff, staff visits, and staff relations. Mr. Neale is 36. After war service as a Motor Transport Company Commander, he graduated from Oxford in 1947 and entered the Chief Staff & Welfare Officer's Department of London Transport in the same year. In 1951 he was promoted to be Senior Executive Assistant in the Recruitment & Training Office, in which capacity he was responsible for the development of staff information and consultation. Since October, 1955, he has been in charge of recruiting and promotion arrangements for administrative and technical staff.

Mr. W. Buttery, M.B.E., Operating Assistant in the Chief Operating Superintendent's Department, East African Railways & Harbours, has retired.

Mr. Arthur Hopper, Accounting Analyst for Canadian National Railways, has retired after 47 years of service with that system.

Mr. K. Stevens has been appointed Manager of the Air Travel Department of Thos. Cook & Son Limited, following the death in December of Mr. L. Duncan.

We regret to record the death on January 18, at the age of 47, of Mr. C. Slymon, Sales Manager of the Friction Materials (Automotive) Division of Small & Parkes Limited.

Mr. J. Hugh Neill, Deputy-Chairman of James Neill & Co. (Sheffield) Limited, is leaving this country on January 22 on a nine-week world business trip. He will visit Bombay and Singapore, Australia (where the company has a subsidiary, Eclipse Tools (Sheffield) Pty. Ltd.), New Zealand and New York. Here the company has another wholly-owned subsidiary, James Neill & Co. (U.S.A.) Limited. Mr. Neill will then visit Canada and fly back to this country from Montreal on March 27.

Mr. C. L. Edwards, Northern Area Manager of C.A.V. Limited, has retired after 45 years with the company broken only by service during the 1914-18 war with the 3rd County of London Yeomanry—"The Sharpshooters." On the occasion of his retirement, Mr. Edwards was presented on behalf of colleagues and friends with a

cheque by Mr. H. G. Mason, Director & Joint General Manager of C.A.V. Limited. Mr. W. H. Simpson becomes Manager of the North Eastern Area of the company, based on the Leeds office.

Mr. T. E. Potts has been appointed a Managing Director of the British Oxygen Co. Ltd.

Dr. A. D. Merriman, formerly Secretary of the Institution of Metallurgists, has been appointed Consultant on Scientific projects to Edgar Allen & Co. Ltd.

Mr. M. F. Dowding has been appointed Chief Engineer of the Davy & United Engineering Co. Ltd. in place of the late Mr. W. W. Franklin, who was Technical Director of the company. Mr. A. A. Thomas succeeds Mr. Dowding as Engineering Sales Manager.

Mr. R. R. Hunter has been appointed a director of Swan Hunter & Wigham Richardson Limited. Mr. Hunter is General Manager of the company's Dry Docks Department at Wallsend.

The Metropolitan-Vickers Electrical Co. Ltd. announces the appointment of Mr. A. O. Ahlquist as Sales Manager, Mechanical Department. Mr. Ahlquist succeeds Mr. H. Lawson-Jones, who will act in an advisory capacity and who has been transferred to Sales Management.

Mr. B. Brewster Jennings, Chairman of Socony Mobil Oil Co. Inc. & Chief Executive Officer of the company, will retire on January 31. Mr. Albert L. Nickerson, President since 1955, becomes Chief Executive Officer, and Mr. Fred W. Bartlett, a director since 1953 and Vice-President for Producing since May, 1957, becomes Chairman.

Mr. R. Anthony Beckett, Managing Director of Beckett, Laycock & Watkinson Limited, leaves this country at the end of this month for a 10-week visit to Australia and New Zealand. Mr. Beckett will return via the United States and Canada, where he will visit his company's subsidiary.

Mr. W. W. MacArthur, Works Director of Craven Brothers (Manchester) Limited, accompanied by Mr. E. Clarke, a senior member of the company's engineering staff, will leave this country on January 26 by air for a tour of the Sudan, east central and southern Africa, and Angola, Nigeria, Ghana, and Sierra Leone. Mr. MacArthur and Mr. Clarke will study local conditions and visit leading railway maintenance workshops in these territories.

Mr. P. C. Beckett has been appointed to take charge of a new office established by Sanders & Forster Limited, structural steel specialists and manufacturers of standard steel buildings, at 31, Charlotte Street, Port of Spain, Trinidad. The new office, which will work in close association with the company's main Trinidad agents, Lee Lum Limited, will be responsible for all estimating, sales, and general correspondence.

After over 40 years of service with George Spencer, Moulton & Co. Ltd., Mr. J. C. Spencer, Joint Managing Director, has decided to relinquish his executive duties. His family has maintained an unbroken association with the company for over 100 years. Mr. Spencer has been elected President and will retain his seat on the board of the company and of its subsidiaries. He wishes to keep his contacts with his many friends in the railway world and will continue to make use of an office in London. Mr.

A. J. Gibson assumes full executive control of the Railway Sales Department, Home Trade, and Mr. N. W. Manby continues as Manager of the Railway Sales Export Department. The directive control of the company's affairs rests with the Managing Director, Mr. O. F. Swanborough.

Mr. A. Clark has been appointed Chief Chemist at the Cricklewood Laboratory of British Oxygen Gases Limited. He succeeds Mr. C. Coulson-Smith, who has retired from the company.

Mr. P. A. J. Linforth, Midland Area Manager for Silentbloc Limited and the Andre Rubber Co. Ltd., is retiring on the 31st of this month for health reasons. Mr. F. J. White has been appointed as his successor.

Mr. Keith Granville, Commercial Director of the British Overseas Airways Corporation, has also been appointed Deputy Managing Director of the Corporation. He will assist Mr. Basil Smallpeice, Managing Director.

British Insulated Callender's Cables Limited announces the appointment of two new Branch Managers. These are: Mr. A. F. Miller, to be Branch Manager at Aberdeen, and Mr. L. R. Cieworth, to be Branch Manager at Newcastle.

Mr. K. G. Lampson, Lt.-Colonel P. F. Benton Jones, and Lt.-Commander G. W. Wells have been appointed directors of Steel Peech & Tozer Limited and of the Workington Iron & Steel Companies Limited. Lt.-Colonel Benton Jones also has been appointed a director of the Beckermat Mining Co. Ltd.

Mr. P. L. P. Ward has been appointed Assistant Traffic Manager of Jamaica Omnibus Services Limited and is expected to leave the United Kingdom early in March to take up his new appointment. Mr. Ward, who is a graduate of the B.E.T. Training Scheme, is at present Assistant to the Area Manager, Portsmouth, South-down Motor Services Limited.

Mr. G. E. Liardet has been appointed Chairman & Managing Director of the newly-formed Simms Motor & Electronics Corporation Limited and relinquishes his position as Managing Director of Simms Motor Units Limited while retaining the Chairmanship of the board of that company. Mr. J. Ayres becomes Managing Director of Simms Motor Units Limited.

Simms Motor Units Limited announces that Mr. T. Paterson has been appointed Chief Engineer of the Fuel Injection Division, Mr. R. H. Shinwell has been appointed Chief Engineer of the Electrical Division, and Mr. K. Youngham has been appointed Chief Engineer of the Turbo-charger Division of that company. These three divisions have been newly formed from the Engineering Division and each Chief Engineer is directly responsible to the Technical Director, Mr. C. H. Bradbury. Mr. H. G. Dunn, for some years Chief Engineer of Simms Motor Units Limited, becomes an Associate Director and will be in charge of a new division to be known as the Product Development Division. This will be responsible for pre-production development of all products manufactured by the Group. Mr. Dunn also has been made a director of four of the Group's companies: R. F. Landon & Partners Limited, the Industrial Fan & Heater Co. Ltd., Simplus Products Limited, and Hadrill & Horstmann Limited.

NEW EQUIPMENT AND PROCESSES



Improved Hand Grease Guns

THE design of the manufacturer's "pom-pom" type hand guns has been improved. The guns are now in production; they are available in two sizes having capacities of 5 oz. (Type LP) and 3½ oz. (Type MP).

Suitable for lubrication of grease nipple points fitted to a wide range of machinery, these items are constructed of steel. They can dispense soft grease or heavy oil, and pressures of up to 5,000 lb. per sq. in. can be obtained.

Both are available with either Hydraulic, Tat-hexagon or Tecazerk connectors. The prices of the new guns remain unchanged, varying between £1 3s. 9d. to £1 18s. 6d. according to the size and type of connector fitted.

Further details of these hand guns can be obtained from the manufacturer, Tecalemit Limited, Plymouth, Devon.

Gun for Applying Sealing Compound

A TOOL has been developed for the easier application of the manufacturer's joint sealing compound which is used, for example, for glazing roof lights, and sealing of joints of precast concrete constructions which are subject to vibration from rail traffic.

The unit is known as the Seco G gun, and is stated to be easy to load. It is designed to receive the large capacity size cardboard refill cartridge in which the material is supplied. It has a red plastic-sheathed barrel and incorporates features to make joint sealing easier compared with conventional guns.

The trigger thrust is transferred to the plunger through an overhead fulcrum and multiple catch plate assembly which is

stated to increase the mechanical efficiency and thrust by some 35 per cent, thereby ensuring a higher output with reduced effort.

In addition, the trigger and handle have been re-shaped so that the operator can exert maximum pressure, whatever the position of the trigger. A set of three tapered nozzles of varying design is supplied with each unit.

Further details can be obtained from the manufacturer, Secomastic Limited, Bracknell, Berks.

Oil Resistant Transmission Belting

DIXYLON-SUPLEX plastic transmission belting has been developed to retain to a large extent its coefficient of friction when operating where large quantities of running oil are present. Applications include workshop machine tool drives.

The belting is also resistant to abrasion and has in addition anti-static properties. It consists of a layer of pre-stretched polyamide plastic bands of high tensile strength sandwiched between and bonded to plies of fabric woven from man-made fibres. These outer plies are impregnated and covered with a specially compounded synthetic rubber to impart to the belt its oil- and abrasion-resistant characteristics. The belting is normally manufactured in two thicknesses, medium and heavy (approximately 1.5-mm. and 2.5-mm. thick respectively). Heavier thicknesses can however be manufactured to meet special cases where unusually large horsepowers are involved.

The material has a high comparative strength/weight ratio and is stated to be extremely flexible so that it can be used on very small-diameter pulleys and on drives where the peripheral speeds are as high as 10,000 ft. per min. It can be made

endless easily, even on the machine, with simple tools in a few minutes; the resultant joint is practically imperceptible, ensuring smooth and even running. Once initial tension has been deducted, the length of the belt remains largely unaltered and stretch is claimed to be infrequent.

Details can be obtained from the manufacturer, R. E. J. Dick Limited, Greenhead Works, Glasgow, S.E.

Portable Washing Unit

A WASHING unit, which is portable and requires no water supplies, has been developed to provide washing facilities for staff, both in a workshop, and at distant sites suitable, for example, for gangs on the line.

Known as the Swarfega waterless wash

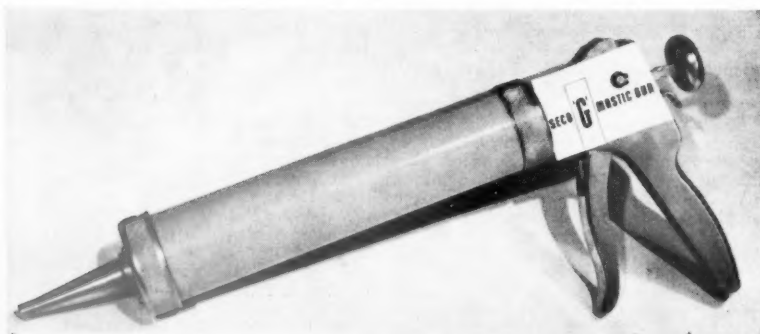


station, the unit is self-contained. It is of strong but light construction and can easily be moved as required. A floor space of only 18 in. x 18 in. is required.

It is pointed out that easily accessible washing facilities encourage workers to greater cleanliness, which in turn, cuts down the incidence of skin troubles.

The unit consists of a Swarfega visible level dispenser for Waterless Skin Cleanser mounted on a turret top waste receptacle. Space is provided on the turret top to attach two paper towel dispensers. Inside the waste receptacle is a canvas sack to catch the soiled paper towels dropped through the pillar box slots. There is room for storage of paper towels and waterless hand cleanser below the sack.

The skin cleanser, for which the machine is designed to be used, is also produced by the manufacturer; although gentle to all skins, it is stated to have a deep



cleansing action which removes grease and oils.

Further details may be obtained from Deb Chemical Proprietaries Limited, Belper, Derbyshire.

Flexible Plastic Hose

A synthetic flexible hose; with the trade name Plastidry, is stated to have a number of advantages over the hoses of more conventional construction now in use in railway installations.

The product consists of a p.v.c. cover and lining fused on to a synthetic fabric tube of nylon, Terylene, or a combination of both, to form a plastic mass possessing strength and resistance to wear. Plastidry is light in weight, and is also waterproof, water repellent and completely immune to the attacks of rodents, insects and fungi.

The hose is undergoing tests by the Western Region. It is non-rotting, unaffected by oils, acids and alkalis, and will not freeze or support combustion. Moreover, it is claimed to be the only hose that coils flat and can be left lying in strong sunlight for considerable periods without suffering appreciable deterioration in strength. It can also be exposed for years to steam or chemically-laden atmospheres without harm. These properties are believed to make it suitable for use, for example, on installations such as stand pipes and water tanks.

Plastidry is available in seven diameters ranging from 1½ in. to 6 in. It can be used for carrying any type of water such as salt, or industrially polluted, and because of its tasteless lining may also be used to carry fresh drinking water, where necessary.

Full details of Plastidry hose can be obtained from the manufacturer, B.T.R. Industries Limited, Herga House, Vincent Square, London, S.W.1.

Cold Starting System for Diesel Engines

A system for the easier starting of diesel engines in winter conditions has been developed. The equipment, the M.G.A. Polar Start, uses Caltex starting fluid capsules; it is suitable for diesel railcars and locomotives as well as for road vehicles. With larger two-bank locomotive engines, two applicators would be required, one for each bank of cylinders.

The 7-c.c. capsule provides the correct quantity of fluid which experience has shown is required to start most engines. The capsules are used with the special applicator permanently connected to the intake manifold system of the engine. A capsule is placed in the applicator where it is punctured by the simple act of pressing down a plunger. The fluid is then released and pumped into the engine by the operator. The applicator, which can be fitted in any convenient position, is illustrated. It is connected to the engine by tubing through which the fluid is passed, entering the engine manifold via jets into the intake air stream.

The starting fluid is a special fuel, which assists engine starting by its low ignition temperature, wide inflammability range and high volatility.

The fluid is applied immediately after the cranking operation has started to turn the engine over, by puncturing the capsule and operating the pump.

Further details may be obtained from the manufacturer of the capsules, the



Regent Oil Co. Ltd., 117, Park Street, London, W.1.

High Speed Bolting System

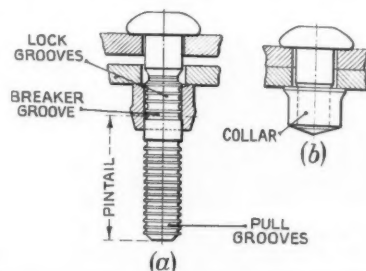
A FASTENER, already widely used in the U.S.A. in rolling stock and locomotive construction, has recently become available in this country. Known as the Avdel Lockbolt it can be used to replace conventional high-strength fasteners such as nuts and bolts and solid rivets with advantageous fitting speeds.

It consists of two precision parts: a bolt with a head and locking, breakneck and pull grooves; and a locking collar. By using a portable pneumatically-operated lockbolt pull-gun, the lockbolts are placed rapidly with quietness and ease, the driving operation being automatic and continuous.

In operation the lockbolt is inserted into a prepared hole, following which the locking collar is placed over the protruding bolt tail. The gun is then applied and the jaws in its nose automatically engage the pull-grooves of the bolt tail. On operating the gun trigger, an axial pull is exerted on the bolt. The reaction to this pull is taken against the collar by a swaging anvil of the pull gun, thus imposing a high clenching action to the work in hand.

As the pull on the bolt increases, the anvil of the pull gun is drawn over the collar, swaging the collar into the locking grooves and forming a permanent lock. The pull continues until the tail of the bolts breaks off at the breakneck groove almost flush with the protruding face of the collar; this ensures that the bolt is always pretensioned and correctly placed. The pull gun continues its stroke ejecting the bolt tail and disengages the swaging anvil from the collar.

The placing sequence can be carried out at high speed up to 30 a minute. Features



of this fastener include high shear and tension strengths and high resistance to fatigue and vibration.

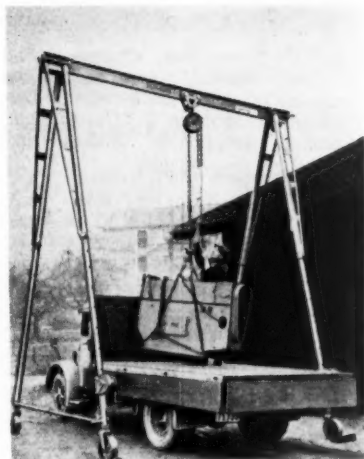
Initially the manufacturer will produce commercial-type lockbolts of ⅞ and 1 in. dia. in L.64 aluminium alloy and steel. At a later date, larger sizes will be produced.

Further details can be obtained from the manufacturer, Aviation Developments Limited, Kingsbourne House, 229-231, High Holborn, London, W.C.1.

Portable Self-Erecting Gantry

THE Colossus portable and self-erecting gantry can be used for hoisting, loading and similar operations in workshops, stores, depots, and so on. An advantage claimed for the unit is good stability to reduce the risk of accidents.

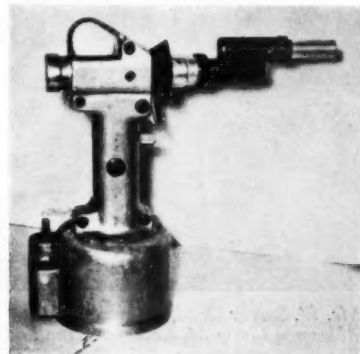
The cross beam, constructed in five sizes, from 1 to 20 tons, is easily adjustable to give increased headroom under the gantry.



Setting up and dismantling of the Colossus equipment is stated to be very simple; for example two men can erect a 5-ton gantry complete with either hand or electric lifting gear in 5 min.

The overall height of the range is from 13 ft. 3 in. to 26 ft. 3 in.; normal span, from 11 ft. 6 in. to 13 ft. 3 in. The basic price range is £150 to £675; extras include adjustable heights and spans.

Further details may be obtained from the manufacturer, which is building the gantries under licence, Anderston Clyde Engineers Limited, Cartbridge Works, Field Road, Busby, Glasgow.



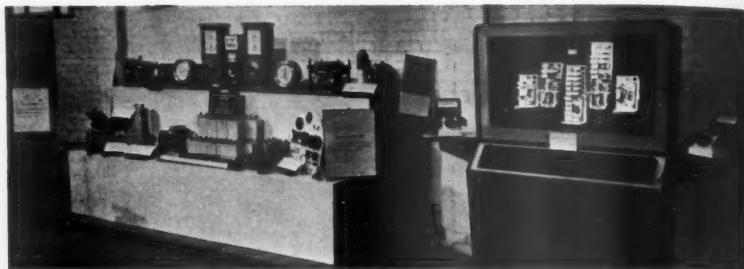


Mr. W. Surrey Dane, Chairman of the "Daily Herald," speaking at the preview luncheon. On his right is Lord Rusholme, Member, B.T.C., and Chairman of the London Midland Area Board

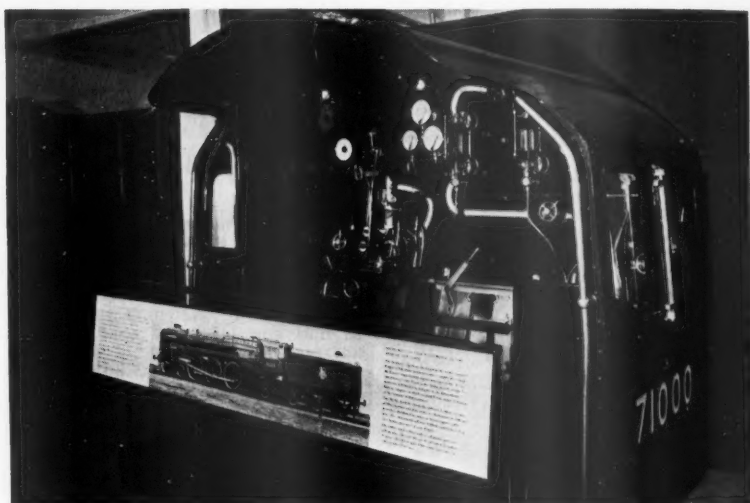
"DAILY HERALD"

HOLIDAY & TRAVEL EXHIBITION

at Belle Vue, Manchester,
January 14—February 8, 1958



British Railways exhibits included this display of signal engineering equipment. To the right is a model automatic telephone exchange



Mock-up of locomotive No. 71000 "Duke of Gloucester," another of British Railways exhibits



Mr. W. Surrey Dane, Chairman of the "Daily Herald" and a Director of Tothill Press Limited, with the Lord Mayor of Manchester, Alderman Leslie M. Lever, and the Lady Mayoress, on the Danish State Railways stand. To the right are Mr. S. Jensen, General Manager of the Danish Tourist Bureau, and Mr. Iversen, Assistant Publicity Manager for that organisation

G.E.C. Work for Railways in 1957

Electric and diesel-electric traction, and electric signalling equipment for British Railways

Work in hand with the General Electric Co. Ltd., and its associates as a result of contracts placed during 1957 covers the three main branches of activity in the British Railways 50-cycle electrification programme. These may be summarised as under:

Motive Power

Seventy-one traction equipments are being supplied for three-car and four-car multiple-unit trains to operate on services from Liverpool Street to Chingford, Enfield, Hertford, and Bishops Stortford. Ten 3,300-h.p. Bo-Bo locomotives are being built to a design developed in close collaboration with the North British Locomotive Co. Ltd., which is constructing the mechanical parts, while the electrical equipments are being manufactured by the G.E.C.

Overhead Line Equipment

Pirelli-General Cable Works Limited, is starting work on the provision of overhead equipment for the first stage of the Glasgow suburban electrification. This covers the provision of foundations, the supply and erection of all structures, and the complete installation of overhead catenaries and contact wires on about 200 single-track miles.

Signalling

The first contract placed for conversion of signalling equipment necessitated by the adoption of 50-cycle traction was awarded to the Siemens & General Electric Railway Signal Co. Ltd. This covered the Colchester-Clacton-Walton scheme in the Eastern Region, and work began in 1957. S.G.E. is also to modify the existing a.c. signalling circuits at Liverpool Street and Fenchurch Street, and from Shenfield to Chelmsford and Southend. These conversions on lines already electrified will be carried out in a manner which will permit the modified circuits to operate both in conjunction with the present 1,500-d.c. traction system and with the forthcoming high-voltage a.c. system.

Diesel-electric Traction

Early in 1957 orders were placed with the Metropolitan-Cammell Carriage & Wagon Co. Ltd., for five high-speed diesel-electric Pullman trains for London-Bristol, London-Birmingham-Wolverhampton, and London-Manchester services. The G.E.C. is the main contractor for the main power equipments of all these trains, in each of which there will be two power cars housing N.B.L.-M.A.N. 1,000-h.p. diesel engines driving main and auxiliary generators.

G.E.C. contributions to the main-line diesel locomotive programme were increased last year by an order for a further 28 electrical equipments for 1,000-h.p. locomotives to be built by the North British Locomotive Co. Ltd., with N.B.L.-M.A.N. diesel engines. This increases to 38 the number of locomotives of this rating for which the G.E.C. is supplying equipment. The first of the ten 800 h.p. diesel-electric locomotives from the North British works will be completed shortly. For these the G.E.C. is supplying the complete power equipments, including the Paxman diesel engines.

An order received in 1957 for power equipments for 40 British Railways standard 350-h.p. diesel-electric shunting loco-

motives, brought the total of such equipments supplied by or in hand with the company to 100.

Other Modernisation Projects

The Southern Region of British Railways, where the 660/750-v. d.c. third-rail system is being retained in the modernisation scheme, is already engaged on preliminary work for electrification extensions to the East Kent coast. For this scheme, the G.E.C. will supply metalclad switchgear and mercury-arc rectifier equipments for a total of 32 substations, together with remote supervisory control apparatus covering all the 63 substations and 65 track paralleling huts in the two phases of the undertaking. The combined rating of the pumpless, steel tank rectifiers will be 85,000 kW.; the switchgear will have a breaking capacity of 750 MVA at 33 kV. Signalling for this scheme will be under-

taken by the Siemens & General Electric Railway Signal Co. Ltd., between Farningham Road and Sittingbourne, with the 7½-mile Sheerness branch; the whole of the latter will be remotely controlled from Sittingbourne through apparatus incorporating the latest techniques for speed of operation and indication.

In the London suburban area of the London Midland Region, 57 three-coach multiple-unit trains are going into service, for which the G.E.C. supplied the complete 630-V. d.c. traction equipment. The trains are operating on the Euston and Broad Street to Watford and Broad Street to Richmond lines. The new prototype light-weight tube trains for London Transport were equipped with traction by G.E.C.

An important signalling contract at Perth undertaken by S.G.E. will concentrate the work of 13 existing signal cables within one new cabin, where the signalling will be controlled by means of keys mounted on the track diagram, over 400 routes being selected by operating one key at the beginning and another at the end of each route.

British Thomson-Houston Co. Ltd.

Substantial orders during the past year for railways at home and overseas

A record number of electric traction orders was received by the British Thomson-Houston Co. Ltd. in 1957; although British Railways orders predominated, a substantial amount of overseas business also was obtained.

The largest traction order ever received by B.T.H. was obtained from the British Transport Commission early in 1957, and covered 25 complete 3,300-h.p. a.c. electric locomotives and 40 traction equipments for similar locomotives which are to be built in British Railways workshops. These locomotives are part of the initial order for 100 required for the first stage of the electrification in the London Midland Region; they will be suitable for use on the 25-kV. 50-cycle single-phase a.c. system and will have d.c. traction motors supplied through mercury arc rectifiers. The first of these locomotives is due for completion in about a year's time.

Work on the 35 a.c. multiple-unit coach equipments, which incorporate germanium power rectifiers, is well in hand and the first 15 of these coaches are to be used on the initial electrification between Manchester and Crewe.

Diesel-electric Locomotives

During 1957, the first main-line diesel-electric locomotives ordered under the modernisation plan have gone into service. These have included some of the 10 800-h.p., British Railways Type 1 locomotives ordered from B.T.H. These are in service in the London Midland Region and are being used initially in the London area on freight duty.

Part of the 20 power equipments for the British Railways Type 2 diesel-electric locomotives, which are being built in the British Railways workshops at Derby, has already been despatched and the first locomotive is due for completion shortly. An order for a further 10 power equipments for these locomotives was received during the year.

Industrial diesel-electric shunting locomotive business has been steadily increasing and there is a very heavy demand

for units in the 150-400 h.p. range. Orders have been received during the year from the Yorkshire Engine Co. Ltd. and Ruston & Hornsby Limited for over 100 power equipments for locomotives in this range; these include 12 power equipments for 400-h.p. Yorkshire Engine Co. Ltd. "Janus" locomotives ordered for Imperial Chemical Industries Limited, Billingham.

Traction Gearboxes

The double-reduction right-angle type of gearbox, mounted directly on the driving axles of diesel-electric shunting engines, continue to be supplied.

Diesel-electric locomotive orders received from overseas include 18 400-h.p. shunters for the New Zealand Government Railways. These will each be equipped with two Rolls-Royce turbo-charged engines. An order has also been received for three 400-h.p. power equipments for shunting locomotives in an industrial undertaking in British Guiana.

On the London Transport railways two experimental regenerative braking equipments are under trial and promising results are being obtained. The interest in these equipments is due not only to the resultant saving in power and in brake shoe wear, but to the reduction in heating in the tunnels, which can become a problem on tube railways with an intensive service. Delivery was also made to London Transport of 64 PCM equipments to be used to re-equip existing rolling stock.

Type RP resistor production has continued at a high level and orders received during the year include a further large quantity for electric locomotives for the South African Railways.

Metalclad Switchgear

After successful completion of an order for 33-kV., 750-MVA., Class MF 36 metalclad switchgear for the British Railways, Southern Region, change-of-frequency scheme, instructions were received during the year for the supply of a further 111 units for substations on the extension of electrification to the East Kent lines

London Airport Monorail Proposal

A decision is reported as likely to be made by the Government within the next few weeks on the proposal to link central London and London Airport with a monorail system. Mr. G. R. H. Nugent, Parliamentary Secretary to the Ministry of Transport, who returned to London on January 17, after inspecting the Alweg demonstration length of monorail at Cologne, said he was favourably impressed with what he had seen of the German installation. British technicians are still in Germany examining the Alweg system. Their report will be sent to the Minister of Transport who will then say in principle whether a monorail system can be adopted, and what safety tests must be carried out before a London Airport route can be built.

Private Enterprise

If the principle is accepted, the practical application will be left to private enterprise. A group led by Sir Alfred Bosson, called Air Rail, Limited, has already produced plans for linking London Airport with Waterloo, Victoria, or the Cromwell Road air terminal, by a double track monorail at an estimated cost of £8,000,000. The car designed by the group is about the size of an underground railway carriage and would have wheels so that it could leave the monorail and drive across the airport on ground level. The system is planned to run mainly alongside existing railway tracks as far as Feltham and then across the airport to a point where the cars could leave the rail and drive through the road tunnel.

The members of Air Rail Limited are: Major-General R. F. K. Belchem, Tube Investments, Limited; Mr. E. C. Beck, John Mowlem, Limited; General Sir William Morgan, Gloucester Railway Carriage & Wagon Co. Ltd.; Mr. E. G. B. Bush, Concrete Limited; Mr. E. M. Ellison, Associated Portland Cement Manufacturers, Limited; Lt.-Colonel F. T. Orman, Orman & Partners; and Lt.-Colonel C. W. Kirkland, Travers Morgan & Partners.

Diesel Maintenance Depot at Sheffield

The Eastern Region has announced details of a diesel maintenance depot which is to be built at Sheffield to provide servicing facilities for diesel railcars in the area. Plans at present envisage the use of 60 diesel railcar units around Sheffield which are to be based upon this depot.

Because railway facilities at Sheffield are congested, it was found that the only site which would enable present requirements to be met, and at the same time offer scope for expansion in the future, was that already occupied by the small electric locomotive depot at Sheffield (Darnell). This is therefore to be adapted and enlarged for use as a diesel depot.

Inspection Shed

The shed will be a steel-framed building 300 ft. long and 60 ft. wide, having three roads and affording covered pit accommodation for six 2-car diesel sets.

The walls will be of brick for the first 4 ft. and of glass for the remaining 22 ft. to the eaves. Power-operated roller shutter doors will be fitted. There will be inspection pits between the rails, side pits and lighting equipment for work on the under-

floor engines and transmissions of the units.

Workshops, offices, stores and staff accommodation (the latter including a mess-room for 24 persons) will also be provided. The shed is being so designed that should it become necessary in the fairly distant future to convert the shed for the use of electric locomotives this will be a fairly simple operation. There will also need to be some alteration to existing overhead structures and to the signalling equipment associated with Darnall West signalbox.

The building is being erected under the direction of Mr. A. K. Terris, Chief Civil Engineer of the Region.

Experimental Electrogyro Locomotive

A shunting locomotive embodying an unusual form of power transmission has been developed for the National Coal Board. Known as an electrogyro locomotive, it derives its haulage power from energy stored in two flywheels, each of which is combined with a squirrel cage induction motor.

These devices are the electrogyros which work first as motors, taking electrical energy from a three-phase supply, converting it into kinetic energy which is stored in the flywheels. When the locomotive moves, the stored energy is reconverted into electrical form and supplied to two traction motors which drive the locomotive. The gyros normally work from just under 3,000 r.p.m. to about 1,800 r.p.m. Speeding up takes 2½ min., this charging enabling the locomotive to work for periods of up to about 30 min., depending on the duty.

The unit is now undergoing surface trials at Seaton Delaval, Northumberland; if the system and the equipment prove themselves technically and economically, a flameproof gyro locomotive for underground service will be considered. Because the operating cycle of the electrogyros corresponds closely to a haulage duty of a short run followed by a stop, this type

of motive power is stated to offer the possibility of hauling underground trains with improved efficiency.

As the accompanying illustration shows, the locomotive is of the 0-4-0 wheel arrangement; it weighs some 34 tons. The maximum safe operating speed is 15 m.p.h. The locomotive is seen at a charging post; from this a collector pole is swung out pneumatically connecting the engine with four bare contact rails. The gyros are then run up to the maximum operating speed. When the pole is swung back the locomotive can move. The electrical equipment of the locomotive was produced by the Swiss firm of Oerlikon and the mechanical parts by Sentinel (Shrewsbury) Limited.

Staff and Labour Matters

Railway Salaried and Conciliation Staff

The reply by the B.T.C. to the claim of the three railway trade unions, N.U.R., A.S.L.E.F., and T.S.S.A., for improved rates of pay for railway salaried and conciliation staff and a shorter working week is due to be given at a resumed meeting of the Railway Staff National Council arranged for today (Friday).

Railway Workshop Staff

A claim for a substantial increase in the rates of pay of railway workshop staff and for a reduction in the working hours of such staff to 40 a week was submitted by the employees' side of the Railway Shopmen's National Council at a meeting of the Council on January 16. The representatives of the B.T.C. on the Council undertook to consider the submissions and to give a reply as soon as possible.

Miners' Pay Claim

After the rejection by the National Coal Board on January 15 of the claim by the National Union of Mine Workers for a shorter working week for surface employees and a general sick-pay scheme, the union's negotiating committee has decided to recommend to their executive that a claim be submitted for an increase of 10s. a week for mine workers.



National Coal Board experimental electrogyro locomotive with electrical equipment by Oerlikon and mechanical parts by Sentinel (Shrewsbury) Limited, now undergoing surface trials

Contracts and Tenders

Diesel-electric locomotives for the Paulista Railroad

The International General Electric Company, U.S.A., has received an order from the Paulista Railroad for 10 990 b.h.p. diesel-electric locomotives at a cost reported to be \$1,500,000.

British Transport Waterways have placed the following contracts:—

Howard & Dennis Limited, Bedford: three weed-cutting launches for use on the Grand Union Canal and Lee Navigation

Priestman Bros. Ltd., Hull: two "Cub" excavators for use on the Shropshire Union Canal.

British Transport Waterways are also to undertake, by direct labour, bank protection work at Nantwich and at Wheaton Aston, on the Shropshire Union Canal; and between Southall and Hayes, on the Grand Union Canal.

British Railways, Eastern Region, have placed the following contracts:—

Humber Graving Dock & Engineering Co. Ltd., Immingham Dock, Nr. Grimsby, Lincs: repairs to crews accommodation on s.s. *Arnhem*.

British Insulated Callender's Construction Co. Ltd., Kirkby, Nr. Liverpool: supply and delivery of one foundation auger unit for use in connection with the excavation of foundations for structures carrying overhead line equipment for electrified lines

Westinghouse Brake & Signal Co. Ltd., London, N.1: provision of wagon description system for Temple Mills New Marshalling Yard

Arundel Painting Contractors & Company, Louth, Lincs: cleaning and painting of ironwork and steelwork to bridges between Silkstone and Mexborough Stations.

British Railways, London Midland Region, have placed the following contracts:

C. Booth & Son, London, W.C.1: improved staff amenities, empty and loaded wagon sidings, Brent

Butterley Co. Ltd., Butterley Ironworks, Nr. Derby: reconstruction of superstructure, bridge No. 5, north and south western junction lines, Acton

R. G. Horton (Engineers), Limited, Brierley Hill, Staffs: extension to "U" shop and stores building, carriage and wagon works, Derby

L. Fairclough Limited, Adlington, Lancs: 70 ft. dia. turntable, motive power depot, Heaton Mersey

Leonard Fairclough Limited, London, N.W.5: formation renewal and drainage up line, 129 m. 960 yd. to 130 m. 178 yd. Braunston & Willoughby, Staverton Road.

British Railways, North Eastern Region, have placed the following contracts:—

British Plant Hire, Newcastle-upon-Tyne: removal of station building, platforms, Leamside Station

H. Hodges, Sheffield: demolition of bridge No. 17, Wath Branch

Clough Smith & Co. Ltd., Crawley: cable installation, Bradford Valley sub-station

Henry Boot & Sons Ltd., Sheffield: strengthening of embankment between Shaftolme level crossing and Shaftolme Junction

Ridghouse Limited, Aycliffe, Nr. Darlington: fabrication of steelwork, gantries for signal engineer

British Railways, Scottish Region, have placed the following contracts:

Murdoch Mackenzie, Limited, Motherwell: widening and redecking of bridge No. 83, Maybole, and alterations to shed, site clearance, platform, roadways and drainage, new centralised parcels depot, Eglington Street, Glasgow

John McLaren, Limited, Glasgow: alterations to office accommodation, Glasgow

Holland & Hannen & Cubitts (Scotland), Limited, Edinburgh: brick buildings, walls and floors, new repair depot, Road Motor Engineer's department, Kilbirnie Street, Glasgow

Siemens & General Electric Railway Signal Co. Ltd., Wembley: electric signalling work and standby apparatus, Craiglockhart-Slateford line.

The Special Register Information Service, Export Services Branch, Board of Trade, has received calls for tenders as follows:—

From Norway:

The British Embassy in Oslo has reported that the Norwegian authorities have given notice of a call for tenders for the erection of a passenger carrying cable railway having the following specification: length, 5.5 km., rising from an elevation of 270 m. to 1,070 m., and operating at wind speeds not exceeding 25 m. per sec.

Firms interested in tendering should

apply, quoting reference 1/58/BL/MP, by January 25, 1958, to Forsvarets Anleggsdirektorat, Parkveien 68, Oslo, copying their letter to the British Embassy in Oslo, and to the Export Services Branch, Board of Trade. The application should be accompanied by a statement and reference if possible, giving the firm's past experience in this type of work and also the legal and financial status of the applicant. If the firm have agents in Norway their names and addresses should be quoted. Tender documents are expected to be issued on January 25, 1958. The Board of Trade reference is ESB/1459/58.

From South Africa:

1,960,000 cast iron chairs, to drawing type E.3131/3, and in accordance with specification CCE.1/37-1957.

The issuing authority is the Stores Department, South African Railways. Bids in sealed envelopes, endorsed "Tender No. A.7019: Cast Iron Chairs," should be addressed to the Chairman of the Tender Board, P.O. Box 7784, Johannesburg. The closing date is February 14, 1958. The Board of Trade reference is ESB/1449/58.

Further details regarding the above tenders, together with photo-copies of tender documents, can be obtained from the Branch (Lacon House, Theobalds Road, W.C.1).

The Director General, India Store Department, invites tenders for the supply of one locomotive boiler, metre gauge. See Official Notices on page 120.

Russian Railway Delegation at Vulcan Foundry



Mr. B. P. Beshchev (right), Minister of Railways, U.S.S.R., with Mr. A. N. Vassilissin, of the English Electric Co. Ltd., Export Department, in the cab of a 1,000-h.p. diesel-electric locomotive built by the Vulcan Foundry for British Railways, on the occasion of the visit to Britain of the Russian railway delegation

Notes and News

Demolition of Cannon Street Station Roof.—Demolition of the steel framework of Cannon Street Station, Southern Region, roof is expected to begin at the end of March, and to take some nine months. To avoid hindering passengers and trains girders will span the platforms to support scaffolding and cranes for the work.

Five Hundredth Diesel Railcar Completed at Derby.—The 500th diesel railcar was completed recently at the British Railways, London Midland Region Carriage & Wagon Works, Derby. The works produced the first lightweight diesel set in April, 1954, and the first steel diesel set in October, 1956. The present cars being built at Derby have a welded all-steel body, and are operated as three-car units, comprising two motor cars with an intermediate trailer vehicle, each motor car being powered by two 150 h.p. B.U.T. under-floor engines. Diesel railcars built at Derby are operating in the Eastern, North Eastern, Western, and London Midland Regions.

Presentation to Mr. J. B. Hastie.—Major-General G. N. Russell, Chairman of British Road Services, recently made a presentation to Mr. J. B. Hastie, who retired from the post of Scottish Divisional Manager, B.R.S., at the end of December. The presentation was held at the Great Western Royal Hotel, Paddington, and was attended by Sir Brian Robertson, Chairman of the British Transport Commission. Others present included Sir John Benstead, Deputy Chairman, and Lord Rusholme, Member, B.T.C.; Major-General Sir H. Reginald Kerr, General Manager, British Transport Waterways; and Mr. S. E. Raymond, Chief Commercial Manager, British Railways, Scottish Region; besides Members of the Board of Management and officers of British Road Services.

Mr. Harold Watkinson in the Eastern Region.—On his visit to installations in the London area of British Railways, Eastern Region, on January 7, Mr. Harold Watkinson, Minister of Transport & Civil Aviation, travelled by one of the new two-car diesel trains built by D. Wickham & Co. Ltd. and described in our issue of July 5, 1957. These cars are now in regular service in the Region. He visited



The 500th diesel railcar completed recently at Derby Carriage & Wagon Works

the diesel maintenance depot at Stratford, where some diesel locomotives working in the Eastern Region were placed on view. He also inspected the electric train depot at Ilford, the new Temple Mills marshalling yard under construction, and, later, Saracens Head House, the headquarters of Mr. J. W. Dedman, Line Traffic Manager, London Tilbury & Southend, Eastern Region. Editorial reference to the use of lightweight multiple-unit sets for official visits was made in our issue of December 6, 1957.

London-Birmingham Motorway Contract Awarded.—Mr. Harold Watkinson, Minister of Transport & Civil Aviation, announced on January 20, that John Laing & Son Ltd. had been awarded a £15,000,000 contract to build the projected 53-mile London to Birmingham motorway. Work on the project, which forms the southern part of the London-Yorkshire motorway, is due to start in about two months time, and is expected to take some 19 months to complete.

Babcock & Wilcox Limited Issue.—Terms have been fixed and underwriting completed for the issue of £2,000,000 debenture stock by Babcock & Wilcox Limited.

The stock carries a 6 per cent coupon, has 1980-83 as its redemption dates, and is being offered to members and debenture stockholders of the company at a price of 97. Provisional allotments were sent out earlier this week for the issue already announced of 1,881,099 ordinary £1 shares to ordinary stockholders at par.

Collision at Preston Station.—A passenger train struck a light engine, overturned it, and sent it into the rear of a parcels train, outside Preston Station, London Midland Region, on January 16. Twelve people were taken to hospital, but none was seriously injured. A coach in the middle of the parcels train was badly damaged.

Transportation Club Dinner.—The Quartermaster General to the Forces, General Sir Nevil Brownjohn, was the guest of honour at the club dinner at the Transportation Club, 44, Wilton Crescent, S.W.1, on January 21. The Chairman of the club, Major-General G. S. Szilmer, proposed the loyal toast. General Brownjohn then gave a brief account of the way in which the Quartermaster General's branch of the staff, and the associated ser-



British Railways two-car diesel set built by D. Wickham & Co. Ltd.; one of these was used by the Minister of Transport on his recent tour in the London area of the Eastern Region

vices, and indeed the Army generally, were rationalising and simplifying their methods, thereby reducing the cost of Army administration and the demand for administrative manpower. One measure mentioned was the use of containers for transport by rail and sea of stores for British units stationed in Germany, so reducing the cost of maintaining bases on the Continent. He referred also to the smooth working of the military movements organisation, more particularly at the time of the Suez operations; this, he stated, was largely the result of the co-operation received from the railways and other civilian transport in this country. Mr. Harold Wilmot replied on behalf of the Transportation Club.

Electrical Breakdown in the Southern Region.—Trains were held up for three-quarters of an hour in the south-east area of the Southern Region on January 17, due to an electrical breakdown in the sub-station at Lewisham. Signals were automatically set at danger when the current failed, but as the traction current was not affected, trains were able to proceed to the nearest stations under verbal instruction from the signal staff. Passengers completed their journeys by bus.

Luncheon to Mr. A. E. Marriott and Mr. E. O. Lloyd.—A farewell luncheon was given on January 15 to Mr. A. E. Marriott, District Goods Manager (London City) and Mr. E. O. Lloyd, District Goods Manager (London Suburban) of the Eastern Region, who retired on December 31. The hosts were officers of the Commercial Manager's Department under the chairmanship of Mr. F. G. Crabb, Commercial Officer (Headquarters). Mr. G. F. Fiennes, Line Traffic Manager (Great Northern) was also present. Mr. Crabb made presentations on behalf of their colleagues to the retiring officers.

New London Transport Depot at Upminster.—The accompanying illustration shows the new London Transport District Line train depot now under construction at Upminster. When completed, the depot will have accommodation for 34 eight-car trains and will replace the present East Ham depot, the site of which is to be used for a new rolling stock depot for the London Tilbury & Southend Line of the Eastern Region of British Railways. Work on the Upminster depot is likely to be

completed in the Spring of 1959. At present, London Transport trains share two of four tracks between Campbell Road Junction and Upminster with some Eastern Region trains. These tracks eventually will be segregated from the Eastern Region tracks and become the responsibility of London Transport.

Railway Benevolent Institution.—At a meeting on January 20 the Board of the Railway Benevolent Institution granted annuities to ten widows and nine members involving an additional liability of £415 per annum. One hundred gratuities were also granted amounting to £945 to meet cases of immediate necessity. Grants made from the Casualty Fund during the month of December, 1957, amounted to £1,302.

Stowaways in Tender.—One boy died and another was taken to hospital after a trip of more than 100 miles in the coal tender of the "Shamrock" express from Euston to Liverpool, London Midland Region, on January 16. The fireman discovered one of the boys when the train was about 150 miles from London. The train was stopped at Madeley Signalbox, and the other boy was discovered unconscious in the tender. Both were given first aid in the signalbox by a doctor from the train, but one boy died before reaching hospital. The other was detained in hospital suffering from shock. It is believed that when the engine was passing over a water pick-up trough at Whitmore, the boys were soaked by overflow water and stood up. The one who was fatally injured is thought to have struck his head on an overline bridge.

Roller Bearing Axleboxes on Fish Vans.—The first fish special on British Railways to have vehicles fitted with roller bearing axleboxes left Aberdeen at 12.30 p.m. on January 20 for Kings Cross. This train, known as the "Blue Spot Fish Special," has inaugurated a service which it is hoped will go far to eliminate delays to the fish traffic from the North East of Scotland to the London Markets. After extensive tests and experiments by British Railways research and technical departments, 275 vans are being fitted with Timken roller bearing axle boxes. These vans will be used exclusively on the fish specials between the North East of Scotland and the South. The first 100 vans are now ready and, rather than wait for

all to be completed, have gone into service straight away in the 12.30 p.m. working between Aberdeen and London. The balance of the vehicles will be allocated to other services from North East Scotland as quickly as the necessary equipment can be obtained from the manufacturers and fitted to the vans. Many of these are being fitted in the Cowlairs Carriage & Wagon Works of the Scottish Region. Each van has a distinctive blue circle, 15 in. in dia., painted on a white background on each side for easy recognition by railway staff, who will ensure that all such vehicles are used only for the express shuttle service between North East Scotland and London.

C.P.R. Train Derailed by Bomb Explosion.

—A Canadian Pacific Railway train on the Kettle Valley line is reported to have been derailed on January 15 near Grand Forks, after a bomb had damaged the track. The engine, luggage van and one coach left the rails. There were no injuries. Grand Forks is in the West Kootenay district, where bombs were found recently in cinemas.

Tunnel Maintenance on East London Line.

—Special services are being run on the Metropolitan East London Line for several Sundays, including Easter Sunday, while maintenance work is carried out in the tunnel north of Wapping. Trains between New Cross and Wapping run at 15 min. intervals; there is no train service between Shoreditch and Wapping or to and from New Cross Gate; special buses carry railway passengers between Shoreditch and Wapping, calling at Whitechapel and Shadwell Stations; and after 2 p.m. when Shoreditch station closes the special bus service operates between Whitechapel and Wapping. At the southern end of the line passengers with rail tickets can travel by normal bus services between New Cross and New Cross Gate without extra charge. These special arrangements apply every Sunday until April 13 inclusive.

Advice on Timber.—The Timber Development Association has undertaken responsibility for enquiries of a general nature on technical and constructional matters appertaining to timber. To facilitate the provision of quick information to industry such enquiries should be addressed to the appropriate Regional Officer of the Association at the following addresses:—*Scottish Region*, Mr. W. T. Hall, 25, Wellington Street, Glasgow (tel. Glasgow City 5706); *North East Region*, Mr. J. Jowett, 18, Park Row, Leeds, 1 (tel. Leeds 27256); *North West Region*, Mr. H. Wilkinson, 292-3, Corn Exchange Buildings, Fennel Street, Manchester, 4 (tel. Manchester Blackfriars 6770); *South West Region*, Mr. D. H. Carstairs, 16, Charlotte Street, Bristol, 1 (tel. Bristol 23692); or to the head office of the T.D.A. Limited, 21, College Hill, London, E.C.4. Plans are in hand for the extension of this service to industry.

Forthcoming Meetings

January 25 (Sat.).—Permanent Way Institution, at the Institution of Civil Engineers, Great George Street, S.W.1, at 2.30 p.m. Annual winter meeting. Followed by a conversation at the British Transport Commission Headquarters, 222, Marylebone Road, London, N.W.1, at 5.30 for 6 p.m.
January 27 (Mon.).—Institution of Railway Signal Engineers, Bristol Section,



London Transport District Line train depot under construction at Upminster, showing newly laid and ballasted track

- at the Staff Canteen, Temple Meads Station, at 6 p.m. Paper on "Developments in signalling equipment in relation to the 25 kV. electrification project," by Mr. W. M. Sweetenham.
- January 28 (Tue.).—Railway Correspondence & Travel Society, East Midlands Branch, at the N.C.S. Guild Room, Toll Street, Nottingham, at 7.30 p.m. Paper on "North Staffordshire Railway reminiscences," illustrated by lantern slides, by Dr. J. R. Hollick.
- January 30 (Thu.).—The Model Railway Club, at Caxton Hall, Westminster, S.W.1, at 7.45 p.m. Talk on "Out-of-way lines worth modelling" (Part 2), by Laurie Ward.
- February 3 (Mon.).—The Historical Model Railway Society, at the Railway Tavern, Liverpool Street, London, E.C.2, at 7 p.m. Talk on "Materials and techniques for the modeller," by Mr. R. S. Garlick.
- February 4 (Tue.).—The Institution of Civil Engineers, at Great George Street, Westminster, S.W.1, at 5.30 p.m. Paper on "The use of aerial photography by railways," by Messrs. N. E. V. Viner-Brady and H. M. Pearson.
- February 4 (Tue.).—Institute of Transport, at the Connaught Rooms, Great Queen Street, W.C.2, at 12.30 for 1 p.m. Informal luncheon. Principal guest Sir Edward Boyle, M.P., Parliamentary Secretary, Ministry of Education.
- February 4 (Tue.).—The Railway Correspondence & Travel Society, Sheffield Branch, at the Livesey Clegg House, 44, Union Street, Sheffield, at 7.30 p.m. Paper on "A museum for transport," by Mr. J. H. Scholes, Curator of Historical Relics, B.T.C.
- February 5 (Wed.).—British Railways (Southern Region) Lecture & Debating Society, at the Chapter House, St. Thomas' Street, S.E.1, at 6 p.m. Continental film night.
- February 5 (Wed.).—Institution of Railway Signal Engineers, York Section, at the Signalling School, Loft Green, York, at 5.30 p.m. Paper on "Developments in signalling equipment in relation to the 25 kV. electrification project," by Mr. W. M. Sweetenham.
- February 6 (Thu.).—British Railways (Western Region) London Lecture & Debating Society, at Headquarters Staff Dining Club, Bishop's Bridge Road, Paddington, W.2, at 5.45 p.m. Paper illustrated by lantern slides, on "Travel on foreign railways," by Mr. C. Holt, General Manager, Thomas Cook & Son, Ltd.
- February 7 (Fri.).—The Railway Club, at 320, High Holborn, London, W.C.1, at 7 p.m. Annual general meeting (members only) followed, if time permits, by a photographic display by Mr. R. C. Riley.

Railway Stock Market

Business in stock markets has remained on a moderate scale with investment buying centred mainly on British Funds and new issues. There was no particular feature among foreign rails or shares of locomotive builders and engineers. In fact industrial shares generally, though a little more active, remained uncertain. Sentiment reflected a widespread disposition to await the debate on economic affairs and for any fresh information on the reasons for the recent Cabinet changes. The report

of the findings of the Bank rate tribunal was awaited earlier in the week. It is not surprising that buyers were cautious, bearing in mind the many uncertainties that make it difficult to assess the future, including the conflicting views regarding the outlook for Wall Street. That centre rallied a little last week, but best prices were not held, because there are doubts whether there can be an early reversal of the downward trend recently in evidence in U.S.A. business activity. The issue by Shell, which will bring in £45,000,000, and the Royal Dutch issue, as well, will absorb a large volume of investment money, and moreover there are reports that other important new issues will make their appearance before long. In the circumstances it is not surprising that business in securities already quoted on the Stock Exchange is on a moderate scale.

Among foreign rails, there has been some selling of Antofagasta ordinary stock, which as compared with a week ago, moved down further from 18½ to 17½, at which there is now a yield of as much as 22 per cent on the basis of last year's 4 per cent dividend. The preference stock, which has lost 1½ points at 34 yields nearly 15 per cent.

Chilean Northern 5 per cent debentures were 31½. Costa Rica ordinary stock remained at 16½ while the first debentures have strengthened to 72½. Guayaquil & Quito assented bonds were again quoted at 75½ and Paraguay Central prior debentures at 12. In other directions, International of Central America common shares remained at \$16½ and the preferred stock was again \$122. Mexican Central "A" debentures have been well maintained at 72½.

United of Havana second income stock was again 7½ and the consolidated stock 2, while San Paulo Railway 3s. units have kept at 2s. 1¼d. and Brazil Railway bonds were 5½.

Canadian Pacific rallied with Wall Street and were up to \$49½, compared with \$45½ a week ago, while the 4 per cent debentures remained at £63½ and the 4 per cent preference stock moved fractionally higher at £53½. White Pass shares were also better at \$14½.

Nyasaland Railways shares were 10s. 3d. and the 3½ per cent debentures 57½.

Westinghouse Brake showed firmness at 32s. 9d. in response to the annual report; Captain A. R. S. Nutting, the Chairman, states that orders ensure very busy prospects and that overseas business represents a high percentage of orders on hand. Elsewhere, Beyer Peacock 5s. shares remained at 8s. Gloucester Wagon 10s. shares were 13s. 9d., and Wagon Repairs 5s. shares 13s. 6d., while Charles Roberts 5s. shares kept at 8s. Birmingham Wagon were 16s. 9d., North British Locomotive 12s. and Hurst Nelson 26s. G. D. Peters remained at 28s. 1½d.

Shares of the Dowty Group strengthened from 31s. to 31s. 3d., Ransomes & Marles 5s. shares were 9s. 9d. compared with 10s. a week ago, and there was a strong rally from 42s. to 43s. 6d. in British Aluminium, while T. W. Ward also improved on balance from 72s. to 72s. 9d. and British Timken gained 1s. 3d. at 43s. 9d. Associated Electrical were 47s. 9d. and General Electric 37s. 6d.; the interim dividend announcement of the last-named company is imminent. English Electric have changed hands around 46s. 7½d. The 5s. shares of the Pressed Steel Company were 13s. at which there is a yield of nearly 5½ per cent. Steel shares were inclined to rally. Colvilles new 6 per cent stock was at a discount of 12s. 6d.

OFFICIAL NOTICES

DRAUGHTSMEN, also a Technical Assistant, required for West End office. Railway or automotive experience preferred. Pension Scheme also luncheon vouchers provided.—Apply in writing, stating age, experience and salary required, to: General Manager, British United Traction Ltd., 96 Piccadilly London, W.1.

RAILWAY Siding Contractors require **ENGINEER/CONTRACTS MANAGER**. Applicants must be able to estimate, set out and supervise contracts from commencement to completion. Progressive position and excellent salary to first class man.—Write full details to Box 511, *The Railway Gazette*, 33 Tothill Street, London, S.W.1.

NATIONAL COAL BOARD—NORTH EASTERN DIVISION.—**TRANSPORT OFFICER** required for No. 3 (Rotherham) Area, Marketing Department. Salary, £1,000-£1,325 per annum. Applicants should possess a full knowledge of rail traffic requirements at collieries and coke ovens, including empty wagon supply and despatch of loaded traffic. An understanding of the organisation of British Railways is essential. They should also be familiar with road transport matters and be capable of supervising the operation of N.C.B. owned lorries. Some knowledge of canal working is desirable. Apply to Administrative Officer, Ramnook Hall, Belgrave Road, Sheffield, 10, by 31st January.

DRAUGHTSMEN, SENIORS AND DETAILERS. The expansion of our development work on disc brakes for railway rolling stock has created additional posts for design and detailing staff on this project. The senior posts carry considerable responsibility requiring much original thinking, and sound previous experience of railway work is essential. Junior detail draughtsmen need have no previous railway experience but have the opportunity to acquire it. Salaries range from £513 per year for detailers at 21, to £900 per year for first class design staff.—Applications should give full details of age, academic qualifications, training, and experience, and should be addressed to the Personnel Manager, Girling Limited, Kings Road, Tysley, Birmingham, 11.

POWER RECTIFIERS

A LARGE manufacturing firm in the Midlands requires an **ENGINEER** to assist in development and design of high power rectifier equipments. The Department handles rectifiers of all modern types and for all kinds of applications, offering scope for exceptionally wide experience and interest, with good salary and prospects. Previous rectifier experience not necessary, but an electrical or mechanical degree or approximate equivalent, and some practical experience, are desirable. Very good residential district, with excellent educational facilities of all kinds.—Apply with full details to Box 506, *The Railway Gazette*, 33 Tothill Street, London, S.W.1.

THE NIGERIAN RAILWAY CORPORATION invites applications for the following post: **RESEARCH OFFICER.** Duties: The Research Officer will be required to supervise and develop the Railway Research Section, which covers metallurgy, photomicrography, soil mechanics, combustion, fuel oil and water testing, chemical analysis and technical and practical investigation into such problems as flange and rail wear, faulty design, elimination of bad riding in rolling stock, etc. Qualifications: Candidates must be chartered civil or mechanical engineers with a science or engineering degree and have at least five years' experience in a supervisory capacity in a large undertaking covering the subjects stated in the above paragraph or they must possess an engineering degree with at least ten years' experience. In each case, candidates must have at least two years' experience in railway research organisation. Salary: £2,250 per annum. Appointments are on pensionable terms or on contract with 20 per cent. gratuity per annum of total pay. Tours: 15 months in Nigeria followed by 15 weeks' leave on full pay. Quarters: Partially furnished quarters are provided at low rental. Allowances: There are attractive family, travelling, transport and other allowances. Send postcard before 10th February, 1958, mentioning the post and this paper, for further particulars and application form, to: The London Representative, Nigerian Railway Corporation, 9, Northumberland Avenue, London, W.C.2.

THE Proprietors of Patent No. 645669, for "Straightening Rails and Rollers therefor," desire to secure commercial exploitation by Licence or otherwise in the United Kingdom.—Replies to Haselittle Lake & Co., 28, Southampton Buildings, Chancery Lane, London, W.C.2.

THE Director General of India Store Department, Government Building, Bromyard Avenue, Acton, London, W.3, invites tenders for the supply of: **One LOCOMOTIVE BOILER METER GAUGE.** Forms of tender may be obtained from the above address on or after 24th January, 1958, at a fee of 10s., which is not returnable. If payment is made by cheque it should please be made payable to "High Commissioner for India." Tenders are to be delivered by 2 p.m. on Thursday, 13th March, 1958. Please quote Reference No. 354/55/DB/RLY.2.

